Inflammation is a useful natural reaction that the body has in response to injury and certain other conditions. Chronic inflammation, however, can be more destructive than beneficial. Indeed, when we hear the word inflammation, we tend to associate with conditions like arthritis and other more serious issues. Nevertheless, there are many common causes of inflammation that are not associated with disease states. These include eating diets high in certain inflammation-promoting foods (e.g., polyunsaturated fats, simple carbohydrates—especially refined sugars, common allergens like casein and gluten), being in colder temperatures, experiencing menopause (with hormone fluctuations), experiencing psychological stress and exposure to environmental toxins.

Ramifications Of Inflammation
That being said, there can still be ramifications associated with common, non-disease types of inflammation, even low-grade systemic inflammation. Examples include but are not limited to everyday aches and pains, alterations in digestion and absorption, behavioral changes, minor disruption in microcirculation and blood flow over the course of the aging process, and a minor negative impact on immune health. In addition, obesity is associated with inflammation.

Specifically, overweight and obese children and adults have elevated serum levels of C-Reactive Protein and other known markers of inflammation. This is not to say that inflammation causes obesity, but rather the reverse: obesity causes low-grade systemic inflammation. While obesity is commonly thought of as adipose tissue, it is also associated with fat storage in other tissues—including the liver and skeletal muscle. This may lead to insulin resistance and may
also stimulate inflammation. Obesity also changes the type of chemicals that our fat cells secrete, which may include the secretion of several pro-inflammatory mediators.\textsuperscript{11} Since chronic inflammation is closely associated with cardiovascular risk factors, including cardiovascular and non-cardiovascular causes of death, this may help explain the increased risk of diabetes, heart disease, and many other chronic diseases in the obese.\textsuperscript{12}

**Anti-Inflammatory Nutraceuticals**

One of the strategies to help decrease inflammation is the use of anti-inflammatory nutraceuticals—and there are many from which to choose. Following is a discussion of some of my favorite anti-inflammatory nutraceuticals, which includes resveratrol, grape seed extract, calcium fructoborate, turmeric (curcumin) and ginger.

**Resveratrol**

Resveratrol (RSV), a natural substance found in grapes, peanuts and Japanese Knotweed (Polygonum cuspidatum), made a big splash when it was introduced into the dietary supplement market because it was considered to contribute to the “French paradox,” the unexpectedly low rate of death from cardiovascular disease in the Mediterranean population, despite a diet that is relatively high in saturated fat. Since then research has demonstrated other benefits for RSV, among them its effectiveness as an anti-inflammatory agent. This was seen in a randomized, placebo-controlled study\textsuperscript{13} investigating the effectiveness of 40 mg RSV or placebo daily (for six weeks) on oxidative and inflammatory stress in normal subjects. The results were that RSV significantly reduced oxidative stress (P < 0.05) and also significantly suppressed levels of several inflammatory markers, including TNF-alpha, IL-6, and C-Reactive Protein (P <). There was no change in these indices in the control group given placebo.

**Grape Seed Extract And Resveratrol**

Grape seed extract contains phenolic compounds known as oligomeric proanthocyanidins (OPC). These OPC have significant antioxidant properties.\textsuperscript{14} In addition, they also appear to have significant anti-inflammatory properties—at least when combined with RSV. In a triple-blind, randomized, placebo-controlled, one-year follow-up, 3-arm pilot clinical trial\textsuperscript{13}, 75 stable—coronary artery disease (CAD) patients received a combination of grape seed phenolics (i.e. OPC) and RSV, grape seed extract alone, or a placebo. The daily doses of the combination were as follows: 139 mg of grape seed OPC for the first six months, and then doubled for the following six months, which would require about 293 mg (a grape seed extract providing 95 percent OPC, 146.32 mg is required to yield 139 mg OPC); RSV was eight mg and 16 mg for the first six months and the remaining six months, respectively. The daily dose of grape seed OPC alone was 151 mg during six months, and then doubled for the following six months. The results showed that after one year, in contrast to the placebo and grape seed extract only groups, the combination group showed an increase of the anti-inflammatory serum adiponectin (9.6 percent, p = 0.01). In addition, in the combination group six key inflammation factors were significantly improved (p < 0.05) without any adverse effects.

Using the same dosage strategy and group types as in the last study, a randomized placebo-controlled, triple-blind, dose—response, 1-year follow-up study\textsuperscript{16} with three parallel arms was conducted in 35 in hypertensive male patients with type 2 diabetes mellitus (T2DM). Results showed that after 12 months there was a significant reduction in levels of the inflammatory markers ALP (p = 0.02) and IL-6 (p = 0.00) in the combination group. In addition, the production of pro-inflammatory cytokines was also reduced significantly.

**Calcium Fructoborate**

Calcium fructoborate (CF) is a form of the mineral boron, known for its role in bone health—but it is also good for joints and inflammation. A double-blind, placebo-controlled study\textsuperscript{17} examined the effect of 108 mg CF twice a day in patients with knee osteoarthritis (OA). Results showed that in the CF group, pain scores at Day seven dropped to 82 percent of the Day one value (from 74.0 to 59.9, p<0.05). By Day 14, the pain score reduced to 71 percent of the baseline (from 74.4 to 52.2, p<0.01). In contrast, there was no significant reduction in pain scores in the placebo group on either Day seven or Day 14. Other measures of pain were also significantly reduced (p< 0.05) on Day seven and Day 14 (p< 0.01). In addition, blood level of C-Reactive Protein were reduced up to 37 percent compared to Day one baseline levels in 79 percent of subjects. Interestingly, the study also showed that blood level of vitamin D was increased more than 19 percent compared to baseline, but not in the placebo group. The CF was well tolerated by all study subjects with no reports of adverse effect.
Calcium Fructoborate And Resveratrol
A 60-day, randomized, double-blinded, active-controlled, parallel clinical trial was conducted in three groups of subjects to evaluate the effects of oral supplementation with CF (112 mg/day), RSV (20 mg/day), and their combination (RSV – 20 mg/day + CF – 112 mg/day) for 60 days on the clinical and biological statuses of patients with stable angina pectoris. Of the total number of subjects included in study (n = 166), 87 completed the test treatment study period and 29 followed in parallel their usual medical care and treatment. Results showed that there was a significant decrease of high-sensitivity C-Reactive Protein in all groups at the 30-day and 60-day visits. At 60 days, this decrease was greater for CF (39.7 percent), followed by RSV + CF (30.3 percent). Markers for congestive heart failure were significantly lowered by RSV (59.7 percent) and by CF (52.6 percent). However, their combination induced a decrease of 65.5 percent. The improvement in the quality of life was best observed for subjects who received the RSV + CF mixture.

Turmeric (Curcumin)
Turmeric, a member of the ginger family, has been used as a traditional remedy in Chinese and Ayurvedic medicine as well as for condiment and flavoring purposes for over 2,000 years, based on records dating back to 600 BCE. Its primary active constituent is the flavonoid curcumin (diferuloylmethane), which is responsible for the plant’s yellow color and the compound providing most of its medicinal qualities. Certainly, research has demonstrated that the curcumin molecules inhibit 5-lipoxygenase (LOX) and cyclooxygenase (COX), resulting in a well-established anti-inflammatory action. This ability to help relieve common, everyday inflammation has been demonstrated in a significant number of published human clinical studies on curcumin.

Ginger
Although it’s probably more known for its anti-nausea properties (i.e., treatment of motion sickness and morning sickness), Ginger is also an effective anti-inflammatory herb that has historically been used for arthritis and rheumatism. In a study of patients with rheumatoid arthritis, osteoarthritis and muscular discomfort, the majority experienced (to varying degrees) relief of pain and swelling. None of the patients reported adverse effects during the period of ginger consumption, which ranged from three months to 2.5 years.

Another double-blind trial found ginger extract to be more effective than placebo at relieving pain in people with OA of the hip or knee. Likewise, in another double-blind study ginger was significantly more effective than a placebo in pain relief and overall improvement. Ginger is considered to exert its anti-inflammatory activity by inhibiting COX-2 and lipooxygenase pathways.

Conclusion
Inflammation may be present in disease or non-disease states. In either case, resveratrol, grape seed extract, calcium fructoborate, turmeric (curcumin) and ginger may be helpful in reducing markers of inflammation, reducing pain, and improving other parameters of health.

References


