



Promote Optimal Health

The pigments that give beets their rich colors are called betalains. There are two basic types of betalains: betacyanins and betaxanthins. Betacyanins are pigments are red-violet in color. Betanin is the best studied of the betacyanins. Betaxanthins are yellowish in color. In light or dark red, crimson, or purple colored beets, betacyanins are the dominant pigments. In yellow beets, betaxanthins predominate, and particularly the betaxanthin called vulgaxanthin. All betalains come from the same original molecule (betalamic acid). The addition of amino acids or amino acid derivatives to betalamic acid is what determines the specific type of pigment that gets produced. The betalain pigments in beets are water-soluble, and as pigments they are somewhat unusual due to their nitrogen content. Many of the betalains function both

as antioxidants and anti-inflammatory molecules. At the same time, they themselves are also very vulnerable to oxidation (change in structure due to interaction with oxygen). In addition to beets, rhubarb, chard, amaranth, prickly pear cactus, and Nopal cactus are examples of foods that contain betalains.

It's interesting to note that humans appear to vary greatly in their response to dietary betalains. In the United States, only 10-15% of adults are estimated to be "betalain responders." A betalain responder is a person who has the capacity to absorb and metabolize enough betalains from beet (and other foods) to gain full antioxidant, anti-inflammatory, and Phase 2 triggering benefits. (Phase 2 is the second step in our cellular detoxification process).

Antioxidant Benefits

What's most striking about beets is not the fact that they are rich in antioxidants; what's striking is the unusual mix of antioxidants that they contain. We're used to thinking about vegetables as rich in antioxidant carotenoids, and in particular, beta-carotene; among all well-studied carotenoids, none is more commonly occurring in vegetables than beta-carotene.

When it comes to antioxidant phytonutrients that give most red vegetables their distinct color, we've become accustomed to thinking about anthocyanins. (Red cabbage, for example, gets its wonderful red color primarily from anthocyanins.) Beets demonstrate their antioxidant uniqueness by getting their red color primarily from betalain antioxidant pigments (and not primarily from anthocyanins). Coupled with their status as a very good source of the antioxidants vitamin C and manganese, the unique phytonutrients in beets provide antioxidant support in a different way than other antioxidant-rich vegetables. While research is largely in the early stage with respect to beet antioxidants and their special benefits for eye health and overall nerve tissue health, we expect to see study results showing these special benefits and recognizing beets as a standout vegetable in this area of antioxidant support.

Anti-Inflammatory Benefits

Many of the unique phytonutrients present in beets have been shown to function as anti-inflammatory compounds. In particular, this anti-inflammatory activity has been demonstrated for betanin, isobetainin, and vulgaxanthin. One mechanism allowing these phytonutrients to lessen inflammation is their ability to inhibit the activity of cyclo-oxygenase enzymes (including both COX-1 and COX-2). The COX enzymes are widely used by cells to produce messaging molecules that trigger inflammation. Under most circumstances, when inflammation

is needed, this production of pro-inflammatory messaging molecules is a good thing. However, under other circumstances, when the body is undergoing chronic, unwanted inflammation, production of these inflammatory messengers can make things worse. Several types of heart disease—including atherosclerosis—are characterized by chronic unwanted inflammation. For this reason, beets have been studied within the context of heart disease, and there are some encouraging although very preliminary results in this area involving animal studies and a few very small scale human studies. Type 2 diabetes—another health problem associated with chronic, unwanted inflammation—is also an area of interest in this regard, with research findings at a very preliminary stage.

In addition to their unusual betalain and carotenoid phytonutrients, however, beets are also an unusual source of betaine. Betaine is a key body nutrient made from the B-complex vitamin, choline. (Specifically, betaine is simply choline to which three methyl groups have been attached.) In and of itself, choline is a key vitamin for helping regulate inflammation in the cardiovascular system since adequate choline is important for preventing unwanted build-up of homocysteine. (Elevated levels of homocysteine are associated with unwanted inflammation and risk of cardiovascular problems like atherosclerosis.) But betaine may be even more important in regulation of our inflammatory status as its presence in our diet has been associated with lower levels of several inflammatory markers, including C reactive protein, interleukin-6, and tumor necrosis factor alpha. As a group, the anti-inflammatory molecules found in beets may eventually be shown to provide cardiovascular benefits in large-scale human studies, as well as anti-inflammatory benefits for other body systems.

Support of Detoxification

The betalain pigments present in beets have repeatedly been shown to support activity in our body's Phase 2 detoxification process. Phase 2 is the metabolic step that our cells use to hook activated, unwanted toxic substances up with small nutrient groups. This "hook up" process effectively neutralizes the toxins and makes them sufficiently water-soluble for excretion in the urine. One critical "hook up" process during Phase 2 involves an enzyme family called the glutathione-S-transferase family (GSTs). GSTs hook toxins up with glutathione for neutralization and excretion from the body. The betalains found in beet have been shown to trigger GST activity, and to aid in the elimination of toxins that require glutathione for excretion. If you are a person who thinks about exposure to toxins and wants to give your body as much detox support as possible, beets are a food that belongs in your diet.

Other Health Benefits

It's important to note two other areas of potential health benefits associated with beets: anti-cancer benefits and fiber-related benefits. The combination of antioxidant and anti-inflammatory molecules in beets makes this food a highly-likely candidate for risk reduction of many cancer types. Lab studies on human tumor cells have confirmed this possibility for colon, stomach, nerve, lung, breast, prostate and testicular cancers. Eventually, we expect to see large-scale human studies that show the risk-reducing effect of dietary beet intake for many of these cancer types.

Beet fiber has also been a nutrient of increasing interest in health research. While many people tend to lump all food fiber into one single category called "dietary fiber," there is evidence to suggest that all dietary fiber is not the same. Beet fiber (along with carrot fiber) are two specific types of food fiber that may provide special health benefits, particularly with respect to health of our digestive tract (including prevention of colon cancer) and our cardiovascular system. Some beet fiber benefits may be due to the pectin polysaccharides that significantly contribute to the total fiber content.

Source: <http://www.undergroundhealth.com/amazing-health-benefits-of-beets/>