

The virtues of beta-carotene

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What is beta-carotene?

Beta-carotene is part of a class of plant pigments called carotenoids which are responsible for the characteristic orange colour of carrots, sweet potatoes, and certain squash. We currently know of about 500 carotenoids

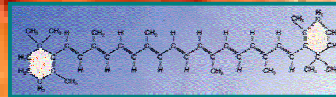


Figure 1 - A photo of beta-carotene under the microscope (left). The chemical structure of beta-carotene (right).

What do they do?

In the plant, pigments like carotenoids play an important role in photosynthesis, capturing light energy and transferring it to the photosynthetic apparatus. For animals and humans alike, plant-provided beta-carotene is the principal source of vitamin A (retinol).

Where can we find them?

Carrots contain the highest concentration of beta-carotene amongst most common vegetables and fruits

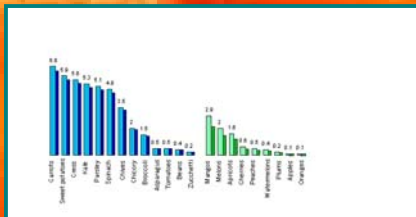


Figure 2 - Comparison of beta-carotene content of some fruits and vegetables (in mg beta-carotene per 100g tissue)

What can affect BC levels?

The amount of beta-carotene found in carrots can vary according to the variety [1,2]. One study found that purple carrots contained 2.2 - 2.3 X more beta-carotene than regular orange ones [2]. Beta-carotene content can also be affected by environmental conditions such as drought [1] as well as post-harvest storage and handling [3,4].

Bioavailability

How much beta-carotene do we absorb? Several recent studies have demonstrated that bioavailability of beta-carotene is improved in processed carrots compared to the raw form [5,6]. For example, one study found that over a four week period, test subjects who consumed thermally processed and pureed carrots on a daily basis had on average 3X more beta-carotene in their plasma than when they consumed carrots in their raw form [5].

As an antioxidant

More recently, beta-carotene's role in animal and human nutrition as an antioxidant has been heightened after about two dozen studies showed less incidences of various forms of cancer and heart diseases amongst people consuming high amounts of beta-carotene rich fruits and vegetables [7,8]. Antioxidants are chemicals that neutralize free radicals which can damage cells, playing a role in several degenerative ailments such as cancer and cardiovascular diseases.

One study even found that plant-sourced carotenoids accumulate in the skin and gave test subjects some measurable protection from UV radiation [9].

Plants vs. supplements

Although there is strong evidence linking the protective benefits of a diet high in beta-carotene rich foods, recent claims by synthetic supplement companies touting the same benefits are yet unfounded. Although beta-carotene has been shown to have some beneficial effects on isolated cancerous cells [10,11], several large-scale clinical studies have shown that beta-carotene supplements alone failed to protect test subjects against lung cancer [12], coronary heart disease [13], and colorectal cancer [14].

So, listen to your mother and eat your carrots, they might just save your life one day!

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