



Carnosine as a Food Supplement

Carnosine is a small dipeptide molecule discovered in 1900 made up of the amino acids beta alanine and histidine. It has been heralded as the most exciting anti-aging nutrient ever discovered, but where is it found and why has carnosine earned such a title?

Found primarily in red meat, carnosine is present throughout the body wherever there are high energy demands such as in the brain, the heart and our muscles. Its function is to protect these vital areas from the metabolic demands of energy production and management. A typical red meat meal may provide 250 mg of carnosine but this is quickly degraded in the body by the carnosinase enzyme. What this means is that even if a person relied on red meat for their carnosine, it would not last long enough in the body to provide sustained protective effects. Supplementation with 1000 mg a day of carnosine overwhelms the carnosinase enzyme, thus enabling one to maintain consistent blood levels of this critical nutrient.

Carnosine first appeared in the mainstream health community over a decade ago in the form of food supplements, eyedrops and skin creams; mostly from companies who touted Carnosine as an elixir of youth. Fast forward some fifteen years and a wealth of research has shown that Carnosine's benefits stretch well beyond anti-aging.

Carnosine is known to be capable of preventing cellular damage from free radicals, such as reactive oxygen species (like hydroxyl radicals and superoxide) and reactive nitrogen species ([study](#)). Like resveratrol, Carnosine is useful in the human body because of its capability of affecting so many different types of tissue.

Mitochondria - Italian researchers found that cells given Carnosine had a complete reversal of age-related mitochondrial dysfunction. The improvement was so dramatic that the cells treated with carnosine actually had better mitochondrial function than those untreated.

Immune System - Carnosine was found to lower excessive immune responses in patients who have overactive immune systems. At the same time, Carnosine increased the immune response in those with under-active immune systems (like the elderly).

This dual, regulatory ability of Carnosine makes it a vital tool for people with delicate immune systems, such as those with allergies and autoimmune conditions

Cancer - The anti-tumour properties of Carnosine were identified more than three decades ago ([study](#)). DNA damage can transform healthy cells into cancerous cells; Carnosine has been found to limit this process ([study](#)).

Carnosine may also be able to inhibit tumour growth and help prevent the spreading of existing cancers (metastasis) to healthy tissue ([study](#), [study](#)).

Furthermore, Carnosine lowers ATP levels in cancer cells, thereby depriving them of the energy they need to develop ([study](#)). Linking back to Carnosine's role in the mitochondria, by reducing mitochondrial oxidative stress, Carnosine has been found to slow the aging of cells that lead to ovarian cancer ([study](#)). Cancer cells exposed directly to Carnosine showed less ability to thrive or proliferate and increased frequency of death ([study](#)).

Gut - In a cell study, Zinc Carnosine decreased damage caused to the villi that line the gut ([study](#)). When the stomach is exposed to bacteria, Zinc Carnosine decreases the production of inflammatory cytokines – the sort of inflammation that would cause bloating and discomfort.

Neuroprotective – The discovery that Carnosine can affect neurological function should come as no surprise seeing as Carnosine is produced by the brain and Carnosine-specific transporters are found in parts of the blood–brain barrier. Carnosine may be an important tool for limiting postoperative cognitive dysfunction. Taking common anaesthetics can often result in an increase in serotonin-derived melanoid (SDM); Carnosine protects against the neurotoxic effects of SDM. ([study](#)) Further research has found that Carnosine prevents the swelling, cell death and free radical stress that occurs when the brain is starved of blood ([study](#)) and treatment with Carnosine was shown to significantly improve neurological function after a stroke-like event ([study](#).)

- **Memory** - In addition to the neuroprotective qualities of Carnosine, one study found that after 3 months of Carnosine supplementation at 500mg/day, patients performed better on verbal episodic memory tests ([study](#)). Similarly, another study demonstrated improved verbal episodic memory in elderly people when they were given a combination of Anserine & Carnosine.
- **Alzheimer's** – Research has found that low blood levels of Carnosine are associated with Alzheimer's ([study](#)). Carnosine may be able to prevent Alzheimer's by counteracting the build-up of aldehydes and amyloid plaques, which are widely considered to be amongst the primary causes. Studies have shown Carnosine act as a Carbonic anhydrase activator; Carbonic anhydrase is lower in Alzheimer's patient brains ([study](#)). An imbalance of naturally occurring metals such as copper, iron and zinc have all been reported to play an important role in exacerbating Alzheimer's pathology; Carnosine is able to chelate these metals.

Wound Healing - Carnosine significantly improved wound healing by increasing the expression of beneficial growth factors and cytokines when taken internally and topically. A cell study found that Carnosine increased the ability of human skin and blood vessel cells to function optimally in the presence of high glucose. Therefore, Carnosine may be an important tool for encouraging wound healing in groups who typically have high blood sugars, particularly the elderly and diabetics ([study](#).)

In summary, growing scientific interest in longevity-boosting compounds has led to ground-breaking new research on Carnosine. Highly concentrated in the brain and muscle, Carnosine is a natural antioxidant and glycation-fighting nutrient whose levels in the body naturally decline with age. A 2010 study revealed that Carnosine extends life span in laboratory animals, consistent with other recent findings that Carnosine fights aging at multiple targets in heart, brain, skin and other organ systems. Carnosine's multiple and interrelated mechanisms of action mean that it can provide benefits to cells and tissues throughout the body that would otherwise succumb to the pathologic effects of aging.