INGREDIENT PROFILE

The Importance of Collagen for Connective Tissue

Collagen is a naturally occurring protein that plays a vital role in the health of skin, joints, bones, tendons, and other connective tissues.[1] Derived from the Greek word "kolla" meaning glue, collagen is basically the "glue" that holds the body together. Collagen is the most abundant protein in the human body, and comprises roughly 30% of the extracellular matrix—a complex network of molecules (fibers, proteins) that provides structure for cells within tissues and regulates diverse cellular functions.[2] As the primary structural element of the extracellular matrix, collagen conveys important properties to connective tissues, such as strength, flexibility, and elasticity. This, in turn, provides functionality to tissues, and helps protect them from damage or injury.[1]

Although collagen is the most abundant protein in the human body, its production gradually starts to decline around the age of 30.[3] Women, in particular, see a significant decline in collagen production following menopause.[4] Other factors that contribute to collagen loss include smoking, poor diet, and exposure to ultraviolet light and other sources of oxidative stress. This decrease in collagen can lead to wrinkles and sagging skin, reduced thickness of the epidermis (the outermost layer of skin), and an increased potential for skin damage.[5,6] Fortunately, oral supplementation with collagen peptides has been shown to stimulate collagen production and help restore collagen stores.[7-9]

Ingredients

Type I and Type III Collagen

Over two dozen different types of collagen can be found in humans and other vertebrates.[1] Considered 'fibril-forming' collagens, Types I and III are two of the most prevalent in the body, and form fibrous structures in connective tissues including bones, tendons, skin, and corneas.[10] Like all collagen types, they are formed by three long chains of amino acids twisted into a triple helix. These chains are predominantly made up of the amino acids glycine, proline, and hydroxyproline, with hydroxyproline playing an especially important role in collagen's thermal stability and biological activity.[1]

As a native protein, collagen is largely indigestible and must first be denatured (broken down using heat) and hydrolyzed (chemically broken down into smaller lengths of amino acids) in order to be digested and absorbed into the bloodstream as collagen peptides.[11] After consumption and absorption, collagen peptides (also known as collagen hydrolysate) travel throughout the body to different tissues, where cells will build the peptides into full-length collagen strands to repair the skin, bones, or joints.[1,11] As a rule of thumb, the smaller the peptide, the faster the intestinal absorption, and presumably, the more collagen that is absorbed.[12,13] For this reason, it is important to find a collagen hydrolysate with low molecular weight (< 6000 daltons) for increased bioavailability.[1]

Collagen can be purified from any vertebrate, but it typically comes from remnants of skin or bones from cows, pigs, or fish. Notably, bovine collagen has been found to contain a higher percentage of the modified amino acid hydroxyproline than fish or pig sources, which gives it an advantage in terms of biological activity and stability.[14-17]

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