



FOOD RESEARCH

NUTRITIONAL MUSCULOSKELETAL SUPPORT

The human body has a system of support for what is contained in it, including bones, cartilage, tendons, and ligaments.

CARTILAGE

Cartilage is a firm, but flexible tissue, that cushions joints and provides structural support. It covers the ends of bones in joints (like the knee) to reduce friction and absorb shock. There are different types, including hyaline cartilage (in joints and the nose), elastic cartilage (in the ear), and fibrocartilage (in intervertebral discs). Cartilage is primarily made of chondrocytes (cartilage cells) embedded in a gel-like extracellular matrix. The matrix consists of collagen fibers, proteoglycans, and water, which give cartilage its flexibility and cushioning ability. Cartilage is avascular (lacks blood vessels), meaning it relies on diffusion for nutrient exchange.

LIGAMENT

Ligaments are strong, fibrous bands of tissue that connect bone to bone and stabilize joints. They also help prevent excessive movement that could lead to injury. For example, the ACL (anterior cruciate ligament) helps to stabilize the knee. Ligaments are made mostly of dense regular connective tissue, rich in collagen fibers (mostly Type I collagen). The collagen fibers are arranged in the body in a slightly wavy pattern, allowing for some elasticity but mainly providing strong, stable connections between bones. Ligaments have some blood supply, but healing can still be slow due to limited circulation.

TENDON

Tendons are tough, rope-like structures that connect muscle to bone. They transmit the force generated by muscles to move the bones. The Achilles tendon, for instance, connects the calf muscles to the heel bone. Tendons are composed of dense regular connective tissue, with parallel bundles of Type I collagen fibers that make them incredibly strong. Tendons have tenocytes (specialized tendon cells) that help maintain the structure. Tendons contain less elastin than ligaments, making them more rigid, which is necessary for efficiently transmitting force from muscle to bone. They have a better blood supply than cartilage but less than muscles, meaning healing is slow but not as slow as cartilage.

Cartilage, ligaments, and tendons are mainly composed of collagen. In addition to various proteins, various nutrients are involved in its production. For example, vitamin C functions as a cofactor for enzymes (prolyl and lysyl hydroxylase) that help stabilize collagen structure. Silicon is essential for the production of collagen and glycosaminoglycans (GAGs), which form the extracellular matrix of cartilage, as it helps in the cross-linking of collagen fibers, making them stronger and more stable. Omega 3 fatty acids can help reduce inflammation, which can degrade collagen over time.



ADVANCED JOINT COMPLEX™

Advanced Joint Complex™ contains bovine tracheal tissue which naturally supplies chondrocytes including glucosamine and chondroitin. Glucosamine and chondroitin work alongside collagen to support cartilage structure and reduce joint wear and tear.

Advanced Joint Complex™ naturally contains carbohydrates, lipids, proteins (including all ten essential amino acids), superoxide dismutase, and truly organic bioflavonoids as found in specially grown, enzymatically processed *Saccharomyces cerevisiae*, Acerola cherry (source of real Vitamin C), New Zealand bovine tracheal cartilage, Burdock root, Alfalfa plant, Aloe leaves, Cayenne fruit, Devil's claw, Horsetail herb, Borage seeds, and Grape seeds (source of proanthocyanidins).

Unlike the commonly sold isolated glucosamine-chondroitin supplements, *Advanced Joint Complex™* also contains herbs, like Devil's claw, which have long been used to support healthy joints.

CAL-MAG COMPLEX

Cal-Mag Complex is a 100% Food supplement that supplies nutrients which support bone health such as calcium, vitamin D, and silicon. Unlike products from other suppliers, *Cal-Mag Complex* does NOT contain USP vitamins or industrially-processed rocks known as mineral salts. All the nutrients shown on the label are in foods and in the same form as would be found in other foods (though at a higher concentration).

INFLAM-ENZYMES™

Inflam-Enzymes™ is a 100% Food supplement that is intended to supply nutrients, enzymes, and herbs needed to maintain and support optimal ligament and tendon health. It is intended to help the body "digest away" inflammatory substances.



LIGAMENT COMPLEX™

Ligament Complex™ helps support healthy ligaments and encourages healthy long term tissue support for athletes. It includes collagen proteins as well as cartilage tissue which contains chondrocytes including glucosamine and chondroitin. It also includes bone meal as well as bone marrow. Nutrients in *Ligament Complex™* support healthy joints and skeletal tissue.

MAGNESIUM COMPLEX

Magnesium Complex is a 100% Food supplement that supplies magnesium in the form found in food. Magnesium helps relax muscles (and sometime the mind).

OMEGA 3/EPA/DHA™

Omega 3/ EPA/ DHA™ is a 100% Food supplement, from cold water herring, that is intended to supply nutrients needed to provide high quality essential fatty acids like omega 3 as well as EPA, DHA, and support factors. In addition to their structural roles, essential fatty acids modulate cell-to-cell interactions. Western diets are notoriously low in life-sustaining omega-3 essential fatty acids. This product is molecularly distilled for purity and to ensure it meets quality standards.

TURMERIC-BOSWELLIA C™

Turmeric-Boswellia C™ supplies herbs which have traditionally been used to support joint health and comfort, as well as real food Vitamin C.

BIOSCIENCE FORMULAS – DENTO-GUMS™

Dento-Gums™ is a chewable tablet that helps support bone, gum, and dental health. It contains ground bovine bones, bone marrow, acerola cherry (source of food vitamin C and bioflavonoids), bovine tracheal cartilage, and herbs.

