

**CartiCol[®],
an undenatured collagen
type II food supplement**



**The no.1
solution
for healthy
joints**

With the ageing population and increasing welfare across the world, we face new health challenges. Joint problems due to arthritis is one of them, and in the Netherlands alone, it already affects approximately two million adults. You can imagine what an impact this disease has worldwide...

The solution is CartiCol[®]. This undenatured collagen type II (UCC-II) food supplement helps prevent collagen degradation in the joints, which is the cause of cartilage damage, leading to joint stiffness and pain. Hence, prevention of collagen degradation means prevention of arthritis-related pain and immobility. CartiCol[®] as a food supplement prevents arthritis-related stiffness and pain, improving mobility.

Choose CartiCol[®], an undenatured collagen type II food supplement, which is effective in treating both rheumatoid arthritis and osteoarthritis, as studies show.

Undenatured type II collagen: an effective arthritis remedy

Cures for arthritis include exercise and medication. The latter, however, has many unwanted side effects. A proper diet, rich in specific nutrients, could help prevent or ease arthritis symptoms. However, with today's over-processed foods and manipulated agricultural products, essential nutrients are lost. Therefore, alternative medicines for arthritis are needed that are both better and cheaper. Nutraceuticals are good alternative medicines to treat arthritis, as scientific studies show.

Undenatured collagen type II, taken in the form of a capsule (oral administration of a food supplement similar to CartiCol®), is effective for the treatment of rheumatoid arthritis and osteoarthritis (see references).

About collagen, joints and cartilage

CartiCol® is most effective for regeneration of cartilage, prevention of joint damage and finally arthritis. In order to understand why this is, we provide some scientific background information below.

Thirty percent of the proteins in our body is collagen, which is the basis of cartilage, tendons, organs, skin, and blood vessels. There are 22 types of collagen. Type I, predominantly present in the skin, and type II in the cartilage of joints, are the most abundant.

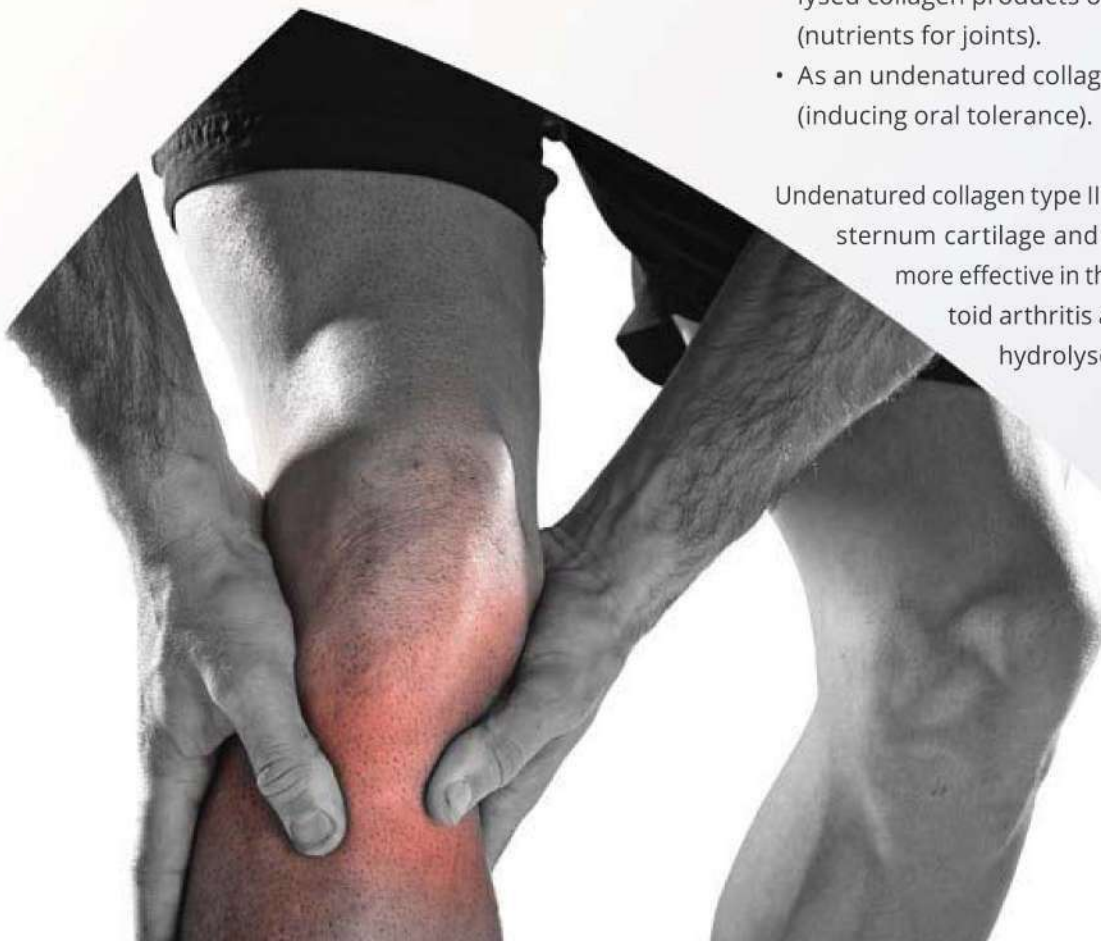
In the joints, where continuous abrasion of cartilage occurs, regeneration is needed in particular. The body, however, has a natural ability for restoration. The effectiveness of this mechanism is dependent on the supply of the right food components. Multiple studies prove that, by the ingestion of undenatured chicken collagen type II, this natural capability of restoration improves significantly (see references). CartiCol® is an undenatured chicken collagen type II product in optima forma.

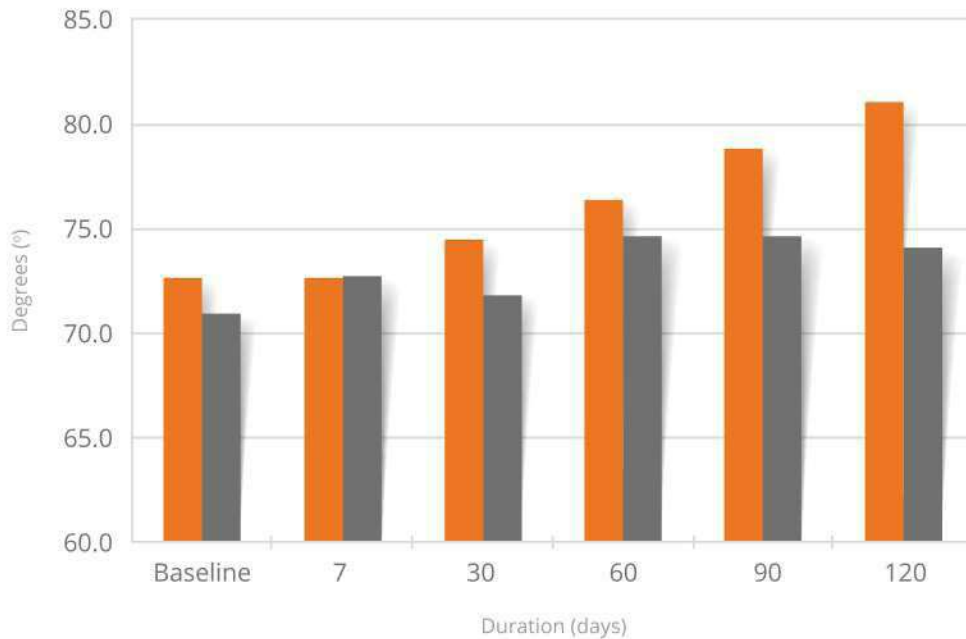
Undenatured collagen type II is more effective

Collagen supplements are taken in different forms for the treatment of arthrosis, rheumatoid arthritis and osteoarthritis:

- As a hydrolysed collagen product; most collagen products on the market are hydrolysed collagen products or gelatines (nutrients for joints).
- As an undenatured collagen type II product (inducing oral tolerance).

Undenatured collagen type II is derived from chicken sternum cartilage and studies show that it is more effective in the treatment of rheumatoid arthritis and osteoarthritis than hydrolysed collagen.





Graph 1: Graph shows the average knee extension in healthy subjects. The effect of undenatured collagen type II is clinically studied in healthy, active adults. The **orange bars** represents subjects treated with undenatured collagen type II, the **grey bars** represents subjects receiving placebo.

References

Safety and efficacy of undenatured type II collagen in the treatment of osteoarthritis of the knee: a clinical trial. Crowley DC, Lau FC, Sharma P, Evans M, Guthrie N, Bagchi M, Bagchi D, Dey DK, Raychaudhuri SP. *Int J Med Sci.* 2009;6:312-321.

Undenatured type II collagen for joint support: a randomized, double-blind, placebo-controlled study in healthy volunteers. Lugo JP, Saiyed ZM, Lau FC, Molina JP, Pakdaman MN, Shamie AN, Udani JK. *Int Soc Sports Nutr.* 2013;10:48 1-12.

Efficacy and tolerability of an undenatured type II collagen supplement in modulating knee osteoarthritis symptoms: a multicentre randomized, double-blind, placebo-controlled study James P. Lugo, Zainulabedin M. Saiyed and Nancy E. Lane. *Nutrition Journal* 2016;15:14.

When undenatured collagen type II is taken as a food supplement, the immune system in the intestines recognizes the collagen epitopes in the so-called "Peyer's patches". After a while, the specific T-cells that attack and degrade the collagen in arthritic joints are deactivated. This process is called desensitization. Undenatured collagen type II supplements are recognized by the immune system as normal food substance and therefore, own collagen type II in the cartilage is not attacked anymore. The suppression of the immune system and the ability to recognize food substances is called oral tolerance.

CartiCol® is better than glucosamine & chondroitin

A clinical study of undenatured collagen type II indicates a significantly higher effectiveness in 90 days, in terms of pain and stiffness reduction (WOMAC-score/VAS method), than a dosage of chondroitin + glucosamine (see references).

The power of CartiCol®

CartiCol® helps suppress and prevent inflammatory reactions, and stimulates regeneration of cartilage and it reduces joint stiffness and pain.

A big advantage is that undenatured collagen type II works at a very low dosage of 30mg/day and has an immune modulating component to it. Therefore, it is much more effective than hydrolysed collagen products, which only provide building blocks for cartilage at a high dose of 10 grams/day.

CartiCol® contains approximately 40% undenatured collagen type II, that is 100% intact. This means that the body will hydrolyse the collagen to functional peptides, inducing oral tolerance. CartiCol® also contains >10% chondroitin, needed for flexibility of the cartilage. The chicken sternum material used for production is sourced exclusively from Dutch EU-registered slaughter houses. The safety of undenatured collagen type II has been extensively examined and demonstrated in various studies.

How to use CartiCol®

CartiCol® works as an immune modulating agent in a very low dosage of 30 mg/day, to be taken orally (preferably in capsules).



About TKPT

Ten Kate Protein Technologies in the Netherlands was founded in 2013 and is a medium-sized company, extracting proteins from pork and poultry. Our revolutionary cold extraction process keeps all the raw materials 100% undenatured. The value of this 100% undenatured collagen type I extraction in food is evident for its functionality in normal food processing. Today, we are also extracting undenatured collagen type II products, for nutraceutical and pharmaceutical applications. TKPT is FSCC2200 and GMP+ approved.

Besides CartiCol®, we also offer raw materials for food supplements for other applications.

Note

CartiCol® is a food supplement and is not a medicine to diagnose, treat, cure or prevent diseases. Statements have not been verified by the FDA.



Ten Kate

**PROTEIN
TECHNOLOGIES**