



seagarden

100% NATURAL



NUTRICOLL

NORDIC MARINE COLLAGEN

From the North Atlantic Ocean

WHY ARE MARINE COLLAGEN PEPTIDES UNIQUE?

Collagen peptides, whether orally ingested or topically administered, have positive effects on human health and beauty. Human collagen is vital for the elasticity, flexibility and strength of skin, tendons and ligaments, but also of the cornea, cartilage, bones, blood vessels and gut.

Fish-derived collagen peptides are receiving more and more attention due to their favourable characteristics and fewer consumer reservations compared to mammal-derived ingredients. Collagen obtained from marine sources are of type 1, and is produced and stored in cells in skin and connective tissues as well as playing an important role in bone tissue. Type 1 is the most common types of collagen and is the main type in humans.

STUDIES HAVE PROVEN THE IMPACT OF MARINE COLLAGEN PEPTIDES ON PERSONAL APPEARANCE AND THE MUSCULOSKELETAL SYSTEM

1. ANTI-AGING EFFECT ON HUMAN SKIN

Marine collagen hydrolysate has an anti-aging effect on human skin. A recent clinical trial demonstrated a significant increase in skin elasticity in a group of women aged 35-55 years (Proksch, Segger, et al., 2014).

2. REDUCING SKIN WRINKLES

The same group of scientists from the University of Kiel, Germany, also demonstrated a significant reduction in skin wrinkles after daily consumption of a collagen hydrolysate (Proksch, Schunck, et al., 2014).

3. INCREASING THE SKIN MOISTURE LEVEL

A comprehensive study of the effect of oral collagen peptide supplement on skin-aging involving clinical trials with Japanese and Caucasian women showed good effect on skin moisturization. The fish collagen peptides were shown to increase the skin moisture level by 12 % in a period of 8 weeks. A consistent increase in the skin collagen density over 12 weeks was confirmed by increased dermal echogenicity. Ex vivo studies confirmed the results of the clinical trials and showed an increased amount of water-binding glycosaminoglycans and collagen content in human skin explants incubated with fish collagen peptides (Asserin et al., 2015).

4. PROTECTING HAIR AGAINST CHEMICAL DAMAGE

The conventional way to apply active compounds to skin and hair is the topical administration. Collagen peptides in the range of 0.6-12 kDa can adsorb onto keratin structures like skin and hair. They form a protective layer that prevent damage and moisture loss. Larger molecules bind stronger to those structures, but the water solubility decreases with increasing size. On hair, the collagen peptides also diffuse into the fibrous hair cells. Used in hair styling and dyeing applications, they protect against chemical damage (Schrieber & Gareis, 2007). High molecular weight, but also smaller collagen peptide fragments in a range from 1-3 kD were shown to bind stronger especially on bleached or waved hair structures (Mintz et al., 1991).

5. ADDED VALUE FOR THE MUSCULOSKELETAL SYSTEM

Products containing active collagen peptides have long been present in the US and European pharmaceutical and food markets. Many scientific and preclinical studies show various positive effects on tendon flexibility, ligament stability, muscle and bone integrity and bone metabolism. Another study investigated the effect of specific fish-derived collagen peptides on collagen expression, post-translational modification and mineralization in an osteoblastic cell culture. Fish collagen peptides were shown to upregulate the gene expression of collagen-modifying enzymes and this effect led to an increased collagen synthesis and positive effects on collagen quality and matrix mineralization in the osteoblasts (Yamada et al., 2013).



References:

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- Asserin, J., Lati, E., Shioya, T., Prawitt, J. (2015) The effect of oral collagen peptide supplementation on skin moisture and the dermal collagen network: evidence from an ex vivo model and randomized placebo-controlled clinical trials. *Journal of Cosmetic Dermatology* 14(4), 291-301.
- Schrieber, R., Gareis, H. (2007) *Gelatine Handbook: Theory and Industrial Practice*. Wiley-VCH, Weinheim, 347 pp.
- Mintz, GR., Reinhart, GM., Lent, B. (1991) Relationship between collagen hydrolysate molecular weight and peptide substantivity to hair. *Journal of the Society of Cosmetic Chemists* 42, 35-44.
- Yamada, S., Nagaoka, H., Terajima, M., Tsuda, N., Hayashi, Y., & Yamauchi, M. (2013) Effects of fish collagen peptides on collagen post-translational modifications and mineralisation in an osteoblastic cell culture system. *Dental Materials Journal* 32(1), 88-95.

SEAGARDEN NUTRICOLL

NATURAL FISH COLLAGEN PEPTIDE FROM SUSTAINABLE WILD COD

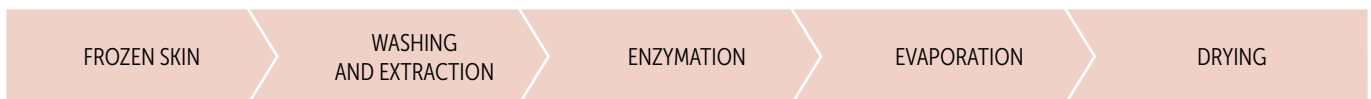
- Natural raw materials harvested from the crystal clear, cold waters of the North Atlantic Ocean
- Collagen type 1 with good and fast solubility
- Average molecule weight: ≤ 3 kD and ≤ 6 kD
- Bio-available protein which is easily digestible
- Mild taste and smell, natural appearance
- GMO Free
- Protein content more than 90 %
- PH 5.0 – 7.0
- Free from artificial additives and preservatives
- Low heavy metal content
- Product suitable for those who don't want to use collagen from traditional bovine and porcine sources



COLLAGEN PRODUCTION PROCESS

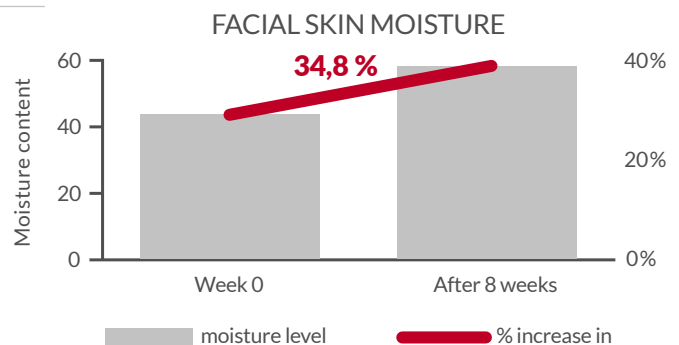
Enzymatically treated and spray-dried into a granulated powder.

Produced according to EU regulations 852/2004, 853/2004 - with EU 2016/355 amending Annex III and 854/2004.



EFFECTS CONFIRMED BY RESEARCH

Seagarden clinical dermatological 8 weeks test with hydration determination on 20 women aged 40 - 55 showed impressive results. Nutricoll Nordic Marine Collagen was easily absorbed and led to a significant increase in skin moisture ($p < 0.001$). The average improvement in facial skin moisture was 34,8%. (Medistat 2017, Germany)



MARINE COLLAGEN WORKS WELL IN THE FOLLOWING PRODUCTS

FOOD: «BEAUTY FROM WITHIN», SPECIAL NUTRITION AND FUNCTIONAL APPLICATIONS

Smoothies, juices, nutri-bars, soups, snacks, sport-shakes.

FOOD SUPPLEMENTS "BEAUTY FROM WITHIN" AND PRODUCTS WITH FOCUS ON MUSCULOSKELETAL SYSTEM

Food supplements in tablets, capsules and shots (powder, jell, liquid), health and beauty drinks.

SEAGARDEN PRODUCT LIST

THE PRODUCTS ARE AVAILABLE IN BULK OR IN VARIOUS PACKAGING: JARS, SACHETS, CARTONS OR AS CAPSULES, TABLETS OR STICKS

1

NUTRICOLL - NORDIC MARINE COLLAGEN

Pure and 100 % natural marine collagen.

2

NUTRICOLL - FLAVORED MARINE COLLAGEN MIXES

Collagen with touch of natural or nature identical flavourings and sweeteners. Flavours: *Lemon, Orange and Strawberry.*



Seagarden Branded Product Range

SEAGARDEN GROUP

A major producer of high quality marine ingredients

- The Seagarden Group is one of the world's major marine ingredients companies producing 100 % natural ingredients for use in savoury, nutritional and pharmaceutical applications as well as personal care and cosmetics.
- Seagarden uses only high quality marine raw materials in its production.
- Seagarden offers more than 50 unique ingredients used in thousands of food and cosmetic products around the world.
- The Company has three production sites along the Norwegian coast.

OUR NUTRITION AND BEAUTY PRODUCTS:

- **Food applications:** soups, sauces, stocks, baby food, snacks.
- **Nordic Protein Powder** from wild-caught cod is suitable for food applications, sport protein supplements, nutritional bars, soups and shakes.
- **Nutricoll Nordic Marine Collagen** from the skin of wild-caught cod is suitable for health, beauty and cosmetics.
- **Chitosan** derived from sustainable sources has outstanding properties for use in cosmetics, haircare and medical applications under the brands Hydamer™ and Chitopharm™.

EXPERTISE AND DEVELOPMENT:

- Joint collaboration with respected research centres; the University of Bergen, Nofima (Food Research Institute), NTNU (Norwegian University of Science and Technology) and the Arctic University of Norway.
- Seagarden contributes to R&D as well as improved documentation for marine products.
- Seagarden is involved in research projects supported by Innovation Norway and the Research Council of Norway.



APPROVALS AND QUALITY CERTIFICATES:

- FSC 22000 certified manufacturer of Natural Marine Ingredients
- Halal approved
- Seagarden takes part in the Responsible Sourcing Audit program, SMETA 4 Pillars
- MSC certified from 01. 10. 2019



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