VITAL PROTEINS®
PROFESSIONAL

BIOACTIVE COLLAGEN COMPLEX

DAILY FOUNDATIONAL SUPPORT**

Product and Research Guide for Healthcare Professionals

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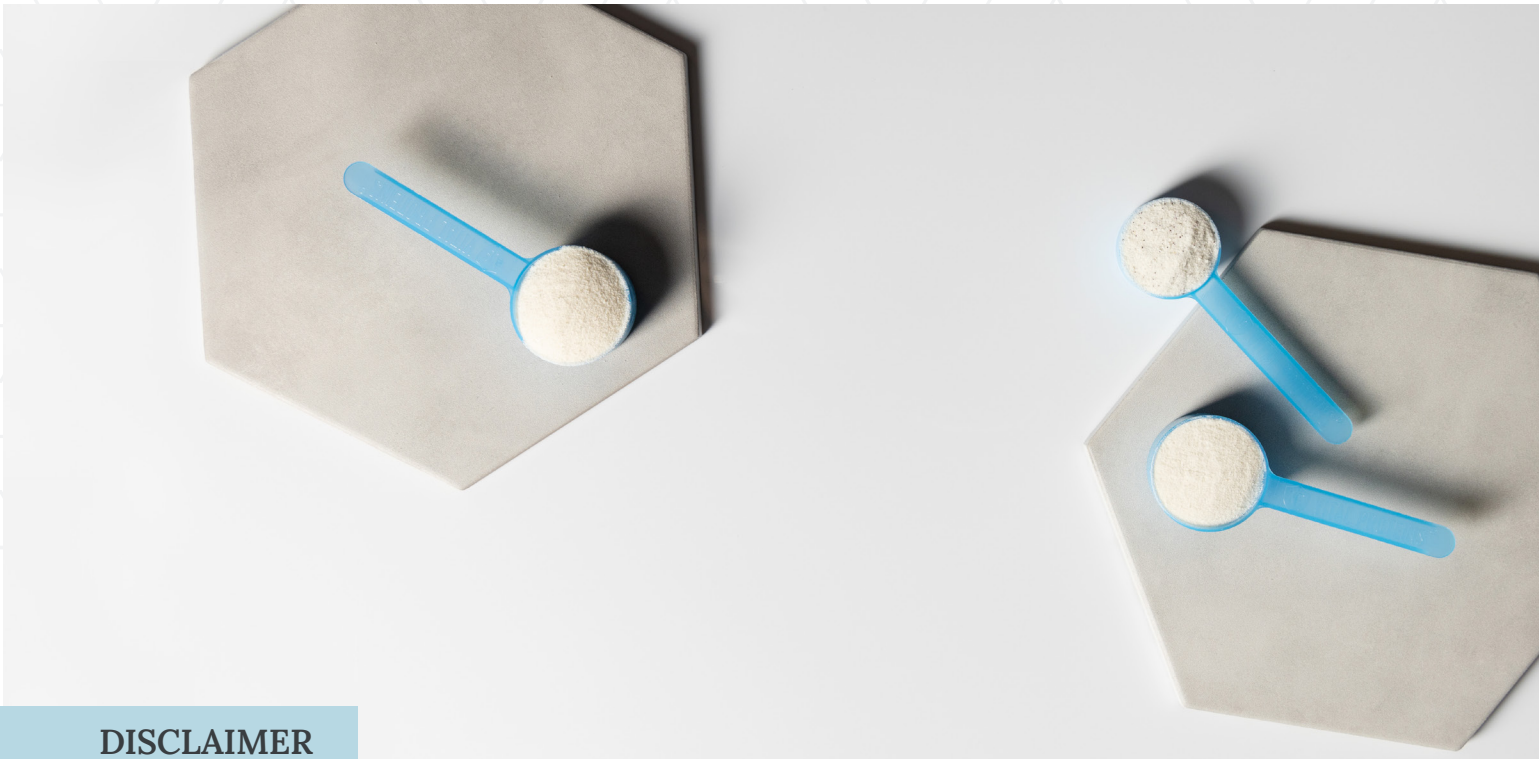

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BIOACTIVE COLLAGEN COMPLEX

DAILY FOUNDATIONAL SUPPORT**

A daily supplement featuring a combination of clinically-backed ingredients proven to promote skin, bone and joint health.**

- Reduces appearance of fine lines and wrinkles**[1]
- Boosts skin elasticity**[1]
- Improves nail growth**[2]
- Increases hair thickness**[3]
- Increases bone mineral density and collagen formation**[4]
- Helps maintain optimal joint mobility**[5]
- Promotes collagen synthesis**

Mix in Hot or Cold Liquids	Grass Fed & Pasture Raised
Made Without Gluten	Made Without Dairy
Made With Non-GMO Ingredients	Made With Bovine Collagen Peptides

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[1] After 8 week supplementation with VERISOL®
[2] After 6 month supplementation with VERISOL®
[3] After 16 week supplementation with VERISOL®
[4] After 12 month supplementation with FORTIBONE®
[5] After 12 week supplementation with FORTIGEL®

RECOMMENDED USE

- As a dietary supplement, mix one scoop in eight ounces of liquid—like coffee, water, or smoothie—and consume every day
- Available as an unflavored powder that easily dissolves in hot or cold liquids, it can conveniently complement your client's daily wellness regimen
- Lacking tryptophan, this supplement is not considered a complete protein. Therefore, it should be recommended as a complement to your client's current protein intake
- While individual results vary, we recommend consuming this supplement daily for at least 12 months based on current clinical research findings
- This supplement can be used any time of day, and may be taken with or without food

POTENTIAL CLIENTS

- BIOACTIVE COLLAGEN COMPLEX Daily Foundational Support** is a multi-benefit supplement intended for individuals wanting to optimize collagen status across skin, bones and joints.** With clinically tested VERISOL®, FORTIBONE® and FORTIGEL®, clients will be confident they are receiving the same molecular forms and amounts used in efficacy trials.
- Clients looking for collagen to support their skin, bone and joint health**
- Active clients wishing to proactively optimize their physical mobility as they age (40+)**
- "Collagen curious" clients seeking collagen supplementation made with clinically-backed ingredients in efficacious amounts

PRECAUTIONS / CONTRAINDICATIONS

- If your client is pregnant, nursing or has a medical condition, use your clinical judgement to determine if this product should be included in their wellness protocol
- Protein contribution should be considered for individuals that need to restrict total dietary protein

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ABOUT BIOACTIVE COLLAGEN COMPLEX DAILY FOUNDATIONAL SUPPORT**

BIOACTIVE COLLAGEN COMPLEX Daily Foundational Support** offers a clinically-backed, comprehensive approach to collagen supplementation. Developed with a team of leading nutrition experts, this formulation combines three types of bioactive collagen peptides with Liposomal PureWay-C™ to help enhance the body's ability to stimulate collagen production.**

BIOACTIVE COLLAGEN COMPLEX Daily Foundational Support:**

- Has been developed with a team of leading nutrition experts
- Features a formulation made with clinically-backed ingredients in efficacious amounts
- Is available in a compliance-friendly format (odorless powder that easily dissolves when mixed with hot or cold liquids)

Ingredient	Benefits	MOA
VERISOL®	• Reduces appearance of fine lines and wrinkles**[1] • Boosts skin elasticity**[1] • Improves nail growth**[2] • Increases hair thickness**[3]	VERISOL® stimulates the fibroblast cells in the dermal layer of the skin to increase their collagen production.** This results in higher production of dermal collagen to help combat what is lost through aging and environmental influences** (Proksch, 2014a).
FORTIBONE®	• Increases bone mineral density and collagen formation**[4]	FORTIBONE® simultaneously stimulates osteoblast formation while reducing osteoclast activity.** This may help counterbalance the collagen degradation in the extracellular bone matrix, which is the essential framework for bone mineralization (König, 2018).
FORTIGEL®	• Helps maintain optimal joint mobility**[5]	FORTIGEL® is designed to work with chondrocytes to stimulate the production of collagen** (GELITA, AG).
PureWay-C™ Liposomal Vitamin C	• Promotes collagen synthesis**	Collagen synthesis is highly dependent upon the presence of antioxidant vitamin C, driving the hydroxylation of proline and lysine in collagen throughout the body. By binding ascorbic acid to lipid metabolites, PureWay-C™ has been clinically shown to be more rapidly absorbed by the body and retained for longer periods of time than other forms of vitamin C (Weeks, 2007).

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FAQ

How is BIOACTIVE COLLAGEN COMPLEX Daily Foundational Support different from VITAL PROTEINS Collagen Peptides?**

- It was formulated with a team of leading nutrition experts
- It contains FORTIBONE®, FORTIGEL® and VERISOL®, bioactive collagen peptides that were individually designed to deliver clinical results to bones, joints and skin**
- In addition to supplying bioactive collagen peptides, it provides PureWay-C™ Liposomal Vitamin C to support collagen synthesis across tissues**

Specific production controls for collagen peptides and product characteristics are shown below:

Collagen Peptide Complex	Source of Intact Collagen	Enzymes Used in Hydrolysis	Time and Temperature of Hydrolytic Enzymatic Bath	Amino Acid Cleavage Locations	Mean Molecular Weights	Bioactive	Activation of Cell Types	Tissues Supported
FORTIGEL®	Bovine Hide	Constant	Constant	Specific	3kD	Yes	Chondrocytes	Cartilage, tendons
FORTIBONE®	Bovine Hide	Constant	Constant	Specific	5kD	Yes	Osteoblasts	Bone
VERISOL®	Bovine Hide	Constant	Constant	Specific	2kD	Yes	Fibroblasts, keratinocytes	Skin, hair, nails
Collagen Peptides	Bovine Hide	Variable	Variable	Nonspecific	3-5kD	Yes	Chondrocytes Osteoblasts Fibroblasts keratinocytes	Cartilage, tendons, bones, skin, hair, nails

How can my clients incorporate it into their cold beverages without clumping?

Fill your glass 1/3 of the way with room temperature liquid

Add 1 scoop of collagen and mix with a fork, spoon or frother

Top it off with cold liquid to fill the glass and mix again

Add ice if desired

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Can I recommend this to someone with a confirmed beef allergy?

To date, we aren't aware of double-blind, placebo-controlled food challenge studies that investigate the effect of collagen peptides on individuals with a confirmed beef allergy. Therefore, we recommend working directly with your client to determine if this product should be a part of their wellness regimen.

How long should it be taken?

Measurable results have been seen in 8 weeks for skin, 3 months for joints and 12 months for bone outcomes**; however, we recommend daily use of this product as part of a long term wellness routine to support continued benefits.

Can I recommend this product with other VITAL PROTEINS products?

Because each individual has unique nutritional needs, please review the supplement fact panel of any Vital Proteins Professional product before recommending it, alone or in combination, with other supplements.

Will BIOACTIVE COLLAGEN COMPLEX Daily Foundational Support help clients recover from surgery?**

While clinical data are not available to support surgical outcomes with use of the product, FORTIBONE®, FORTIGEL® and VERISOL® collagen peptides stimulate the body's own collagen production and are sources of key amino acids involved in recovery and repair. Additionally, Liposomal PureWay-C™ provides a readily available source of ascorbic acid.**

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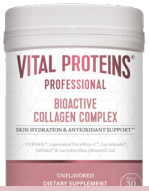
I've seen other Vital Proteins Professional products available. Do you have a comparison chart of the line?

			
	Daily Foundational Support*	***Bone and Joint Support****	***Skin Hydration and Defense Support****
Clinical indications	Clients looking for collagen to support their skin, bone and joint health** Active clients wishing to proactively optimize their physical mobility as they age (40+)** "Collagen curious" clients seeking collagen supplementation made with clinically-backed ingredients in efficacious amounts	Women seeking supplementation to increase bone mineral density** Healthy aging clients seeking to improve their mobility** Athletes of all levels looking to proactively and reactively support their bones and joints** Clients wanting additional functional ingredients to support their bone health** beyond calcium and vitamin D Clients seeking a supplement made with clinically-backed ingredients in efficacious amounts	Clients looking for collagen to support skin hydration and reduce fine lines** Health-seeking clients wishing to augment their skin's resilience to environmental stressors** Clients who are actively seeking a holistic approach to long term skin health** Clients seeking a supplement made with clinically-backed ingredients in efficacious amounts
Bioactive Collagen Peptides	VERISOL®, FORTIGEL®, FORTIBONE®	FORTIGEL®, FORTIBONE®	VERISOL®
Additional supportive ingredients	PureWay-C™ Liposomal Vitamin C	PureWay-C™ Liposomal Vitamin C, Mobilee®, calcium citrate, vitamin K2, vitamin D3	PureWay-C™, Holimel® melon juice concentrate, LycoBeads®, *Lactobacillus johnsonii* (LA1), hyaluronic acid

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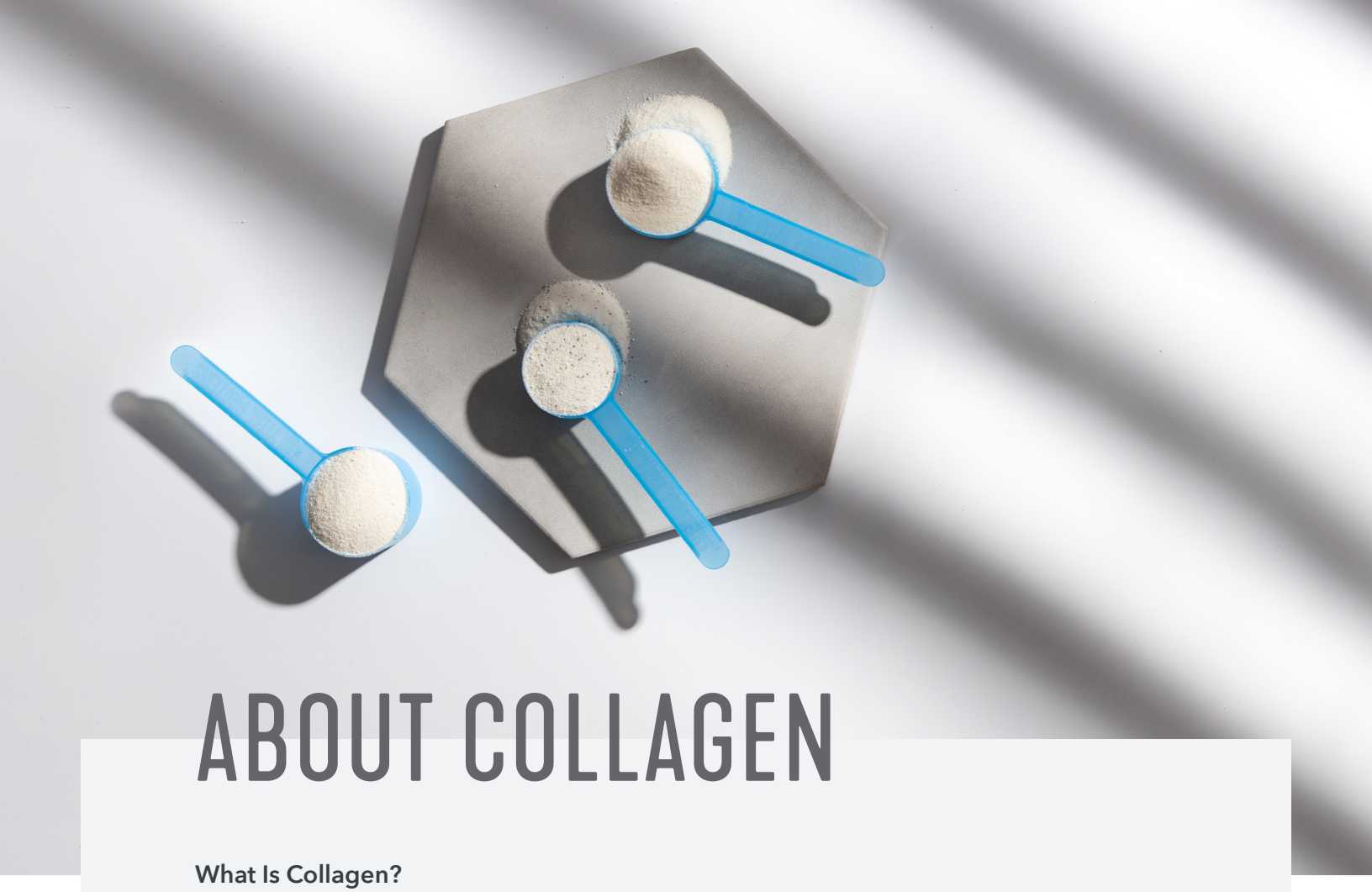

ABOUT COLLAGEN

What Is Collagen?

Collagen is the most abundant protein in the body, making up approximately 30% of total protein composition. Based on the Greek word for glue, or "kólla," collagen serves to connect and hold together the body's structures. Bones, joints, muscles, tendons, and ligaments rely on collagen for their structure, tensile strength and cohesion. Collagen also plays fundamental roles in blood vessels, cornea and teeth. Collagen gives skin a full and youthful appearance, housing the elastin that supports skin's elasticity, and hyaluronic acid, which retains skin's moisture.**

Collagen is composed of three long and intertwined coiled strands, each of which is made up of over 1000 amino acids. Unique to collagen is the prominence of glycine, proline, and hydroxyproline, amino acids that make up about one-third of the collagen molecule. Collagen contains all the essential amino acids, except for tryptophan (Paul, 2019).

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Why Collagen Supplementation?

There are two primary factors driving the need for collagen supplementation. First, biosynthesis of collagen begins to decline in the third decade of life and can contribute to loosening and thinning of the skin, reduction of joint flexibility, and a gradual decrease in joint mobility and functionality. Secondly, dietary collagen intake is generally low. Centuries ago, people utilized bones, broth, organs and tendons to enrich the diet with whole animal sources of collagen nutrition. Today, in contrast, individuals are gravitating towards veganism, vegetarianism, and diets rich in lean muscle meat. Collagenous parts of the animal, like the skin, cartilage and bones, are often discarded.

Why Collagen Peptides?

Collagen peptides are the most bioavailable grade of collagen. The bioavailability and activity of collagen depends upon its form. Native collagen is an intact, triple helix molecule that's insoluble, resistant to absorption and digestibility, and is used primarily for medical purposes. Gelatin, a product of heat-treated collagen, is more bioavailable than intact collagen, but is less likely to become fully broken down into peptides small enough for absorption. Collagen peptides have lower molecular weights and are over 90% bioavailable, with peptides appearing in the bloodstream an hour after ingestion (Ichikawa, 2010, Iwai, 2005). Collagen types with their associated solubilities, absorption capabilities and applications are featured in the table below.

Grade	Form	Solubility	Absorption & Digestibility	Application Examples
Native Collagen		Insoluble	None	Medical materials, collagen casings
Gelatin		Medium	Low	Gelatin desserts, confectionery
Collagen Peptides		High	High	Dietary supplements, functional foods

Completely hydrolyzed by water and a proteolytic enzymatic bath, collagen peptides are more soluble, bioavailable and versatile than the other forms. They completely dissolve when added to hot or cold liquids, and their low molecular weight helps the body easily digest and absorb them. In addition to being a bioavailable source rich in key amino acids, like glycine, proline and hydroxyproline, collagen peptides also appear to have bioactive properties that support the body's production of collagen (GELITA, AG).

Why VERISOL®, FORTIBONE® and FORTIGEL®?

Cells of skin, bone and joints have distinct characteristics. VERISOL®, FORTIBONE®, AND FORTIGEL®, were designed with unique peptide distributions and a different molecular weights, to stimulate collagen production in skin, bones, and joints, respectively.** The specific effects of bioactive peptides on fibroblasts, osteoblasts and chondrocytes remain under active investigation.

Collagen	Cell Types Supported	Health Benefit(s)	Mean Molecular Weight	Effective Daily Amount
VERISOL®	Fibroblasts	Skin, hair and nails**	2 kDa	2.5g
FORTIBONE®	Osteoblasts	Bones**	5 kDa	5g
FORTIGEL®	Chondrocytes	Joints**	3 kDa	5g

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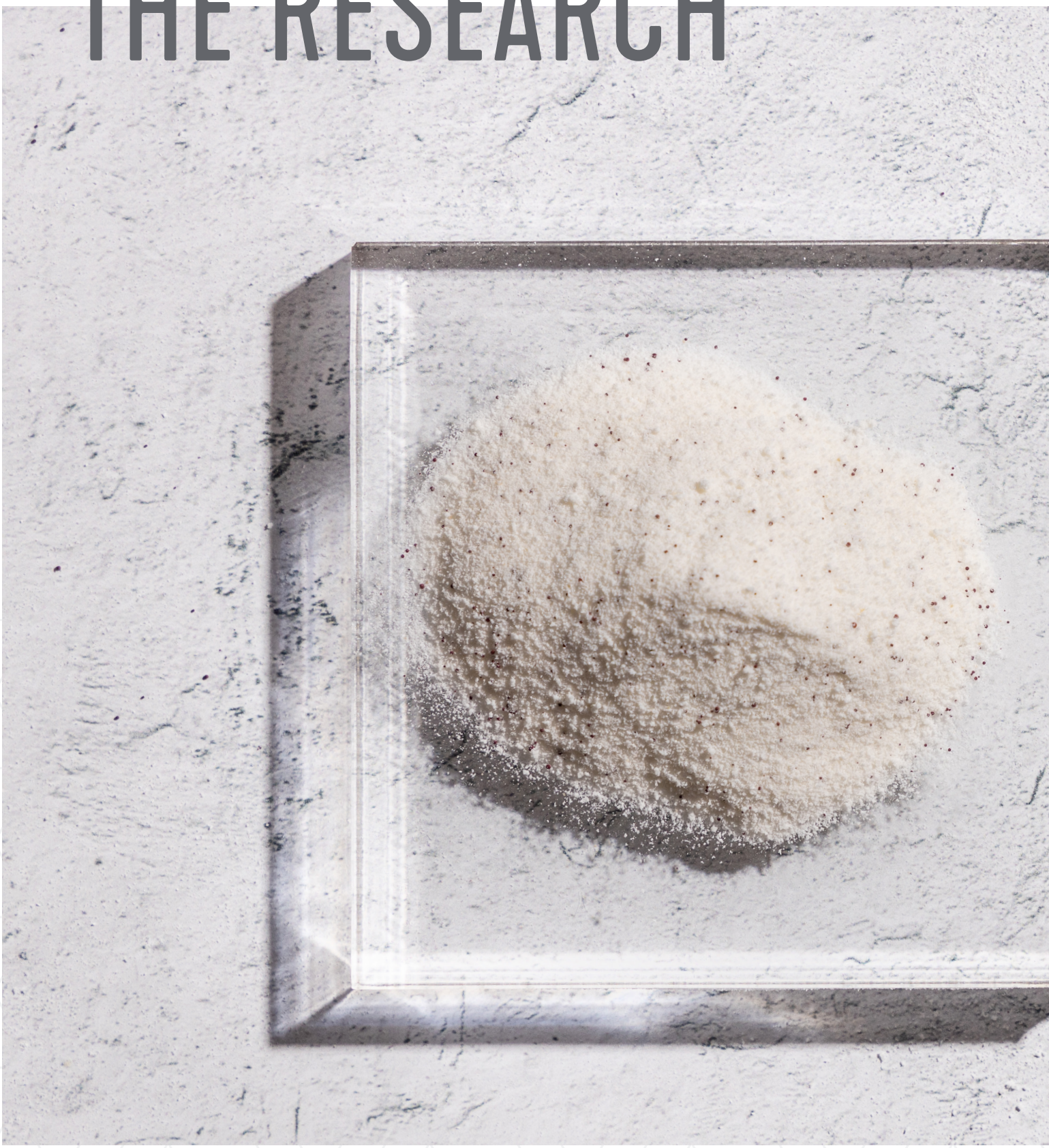
THE RESEARCH



VERISOL®: CLINICALLY-PROVEN TO SUPPORT SKIN HEALTH**

Skin is the body's largest organ and is vital to overall health, serving as a physical barrier, regulating body temperature, and producing vitamin D. The condition of skin changes, based on one's age, diet, lifestyle and other environmental factors. As with all organs, skin undergoes chronological, or intrinsic, aging. Unique from other organs, the skin is in direct contact with the world around us and ages as a result of extrinsic environmental stressors, in particular UVA and UVB irradiation from the sun. Healthy skin is an important component of overall wellness and a major element of outward beauty.

Collagen comprises 75% of the protein in the skin (Wulf, 2004). With increasing age, changes in hormone status, and a decrease in collagen production, skin becomes drier and loses its volume and elasticity. This leads to a reduction in firmness, an increase in fine lines and eventually pronounced wrinkles. Targeting both chronological and photo-aging effects via use of collagen peptides, vitamin C and select nutraceuticals may help promote improvements in the condition and appearance of skin.

Substantial evidence supports the benefits of collagen peptide supplementation for skin (Ohara, 2010, Choi, 2019). In a meta-analysis of 19 randomized clinical trials evaluating 1,125 patients, substantial improvements in skin characteristics were seen in patients receiving collagen peptides compared to patients receiving placebos. Collagen peptides were significantly associated with increased skin hydration, improved dermal elasticity, and reduced wrinkles (Miranda, 2021).

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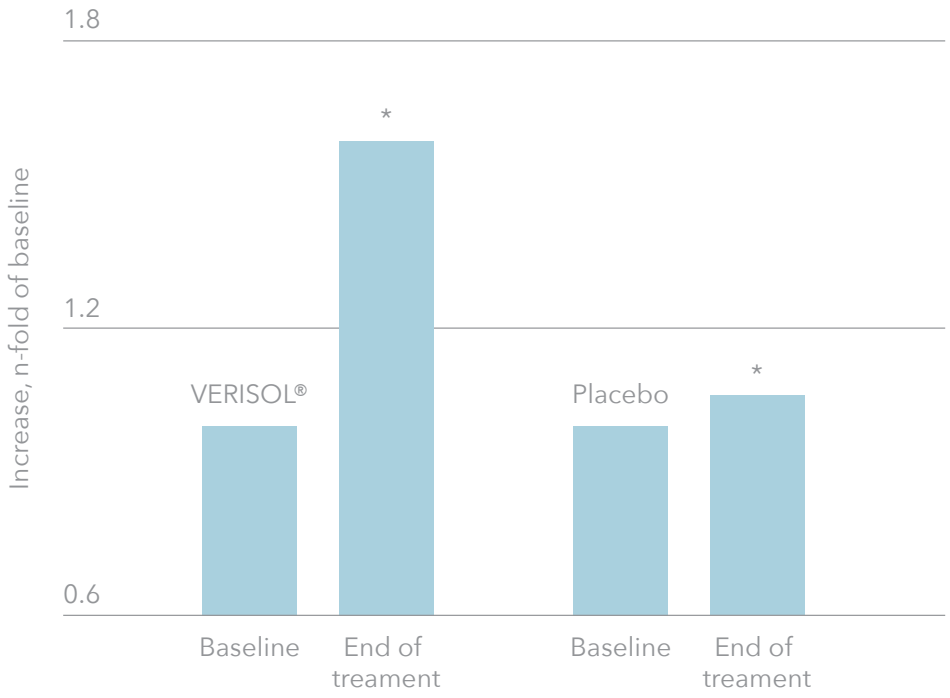
VERISOL® has been clinically shown to improve the condition of the skin as demonstrated in the two randomized, double-blind, controlled trials described below.

In a trial of more than 100 women aged between 45-65 years, oral administration of VERISOL® significantly reduced wrinkles after 4 weeks and led to significantly higher concentrations of skin procollagen (Fig. 1) (Proksch, 2014a).

Fig.1 Increase in dermal procollagen accumulation with VERISOL® (Proksch, 2014a)



*VERISOL® promoted a 65% increase in procollagen accumulation in skin, significantly greater than placebo, *p<0.05*

In a separate trial, 69 women aged 35-55 were randomized to receive VERISOL® or a placebo for 8 weeks. At 4 weeks, women in the VERISOL® group had significantly higher skin elasticity (Fig. 2) and this difference was also observed at 8 weeks. The improved elasticity, as compared to the placebo group, persisted 4 weeks after discontinuation of the product (Proksch, 2014b).

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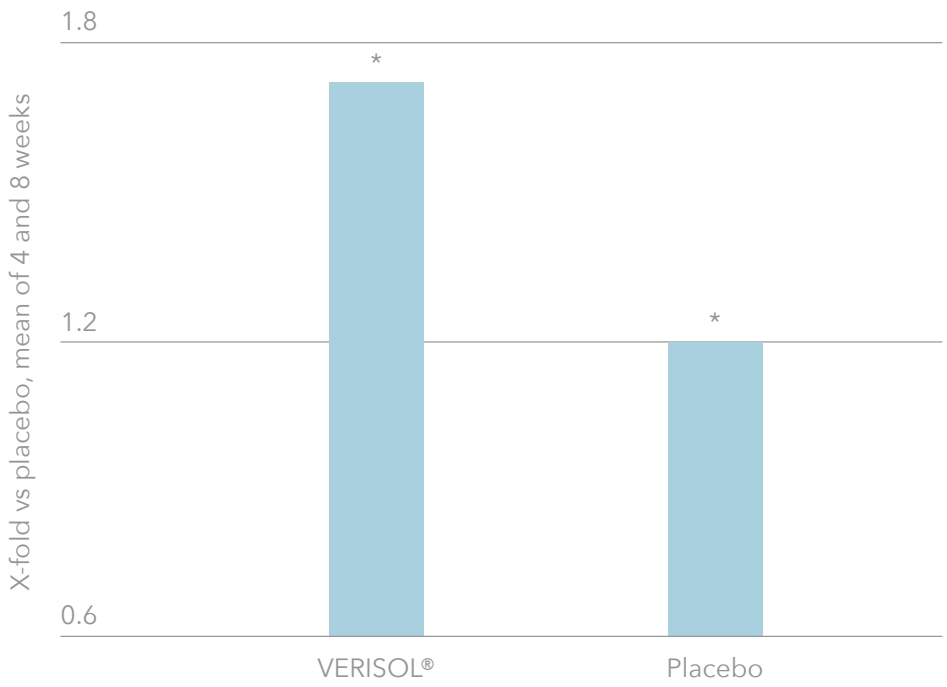
Fig 2. Increased skin elasticity with VERISOL® (Proksch, 2014b)



*Mean increase in skin elasticity with VERISOL®. *p<0.05*

While support of the skin is an obvious target for VERISOL® collagen peptides, fingernails are also dependent on collagen. VERISOL® collagen peptides have been clinically tested for their effects on the growth and strength of fingernails. In a study of women with a history of slow nail growth and nail breakage, daily use of VERISOL® collagen peptides resulted in significant increases in nail growth, and a 42% reduction in nail splitting (Hexel, 2017).

FORTIBONE®: CLINICALLY-PROVEN TO SUPPORT BONE HEALTH**

Collagen makes up 90% of bone's protein matrix, providing the structural scaffolding of bone into which minerals -- including calcium and magnesium -- are deposited. Bone mass and density decrease with age and with the hormonal decline of menopause, (Kehlet 2018, Lupsa 2015) contributing to osteopenia and osteoporosis, and often to debilitating bone fractures. While dietary calcium and vitamin D are well known for their roles in helping to maintain bone mass, collagen peptides may provide additional support.

Effects of supplementation with FORTIBONE® have been positive, as demonstrated in a randomized, double-blind clinical trial (König, 2018).

In a study of 102 women with reduced bone mineral density (BMD), participants received either FORTIBONE® collagen peptides or a placebo for 12 months. After 12 months, mean BMDs of the group that received the FORTIBONE® collagen peptides were significantly higher in both the spine and femoral neck compared to those of the placebo group (Fig 3) (König, 2018).

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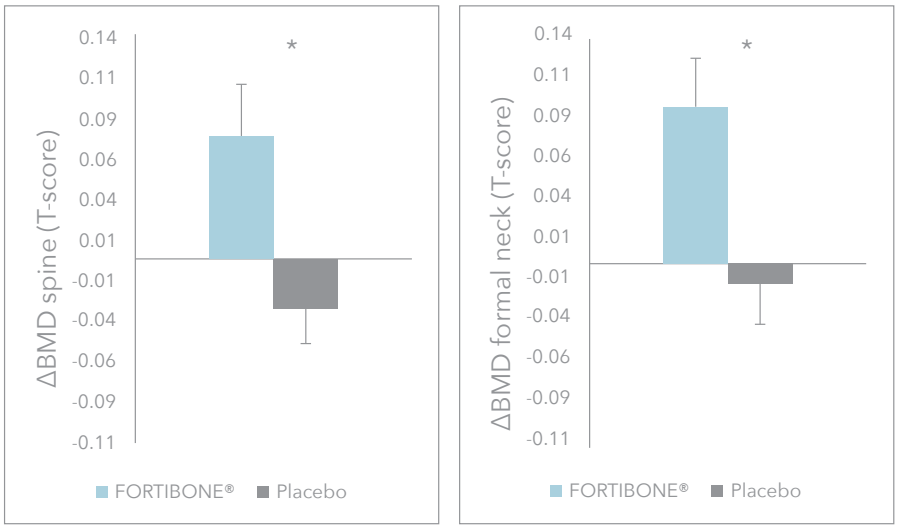
Fig 3. Increase in bone mineral density with FORTIBONE® (König, 2018)



*Change in bone mineral density after 12 months. *p<0.05*

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FORTIGEL®: CLINICALLY-PROVEN TO SUPPORT JOINT HEALTH**

Joints are the connections between bones in the body. Some joints consist of adjacent bones that are strongly anchored to each other by fibrous connective tissue and other joints connect bones via a fluid-filled cavity or capsule. Joints support movement, from our necks, to our toes and almost everywhere bones are connected.

Joints are composed of different types of collagenous material throughout their diverse ligaments, tendons and cartilage. Collagen production is abundant early in life and then tapers off in adulthood. Over time, with wear and tear of joint cartilage and repetitive stress upon joints, joint pain and reductions in mobility emerge and increasingly have effects on productivity and quality of life. While pharmaceuticals mainly treat joint symptoms, such as pain and inflammation, collagen peptides address regeneration of cartilage and bone matrix by stimulating endogenous collagen synthesis (Oesser, 2003).

Clinically studied in randomized, double-blind trials, FORTIGEL® has been shown to help regenerate cartilage, improve joint comfort (Fig 4) and maintain optimal joint mobility (McAlindon 2011, Clark 2008, Zdzieblik 2017, Zdzieblik 2021).**

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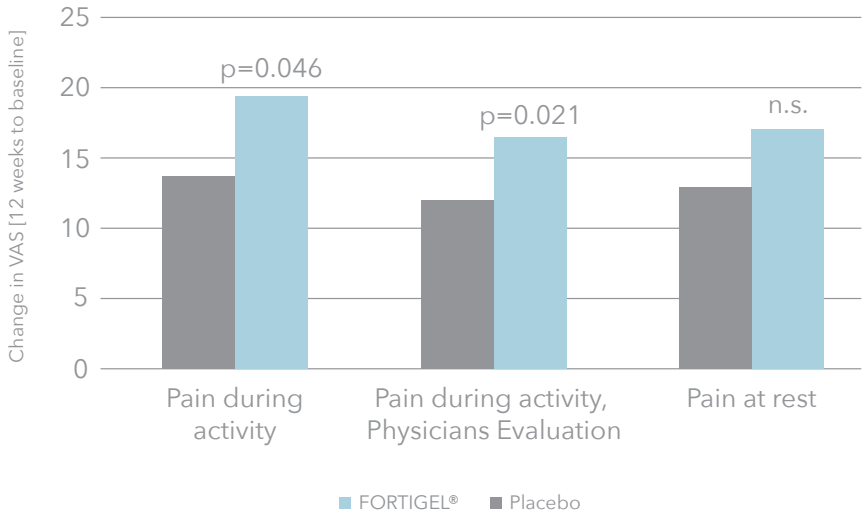
In a double-blind, placebo-controlled study of athletes at Penn State University, 97 athletes were randomized to receive ten grams of FORTIGEL® or a placebo, daily for six months. Athletes who took FORTIGEL® had significant decreases in several parameters of joint pain compared with a group that received a placebo (Clark, 2008). Likewise, in a randomized controlled trial in Germany, FORTIGEL® significantly reduced activity-related knee joint pain in active adults in a randomized controlled trial. After 12 weeks of supplementation with five grams per day, the subjects taking the FORTIGEL® had lower pain scores on visual analogue scales (VAS) compared to placebo subjects. Pain scores documented by physicians were also lower for the FORTIGEL® group vs. the placebo group (Fig.4) (Zdzieblik, 2017).

Fig 4. Reduction in knee joint pain during activity with FORTIGEL® (Zdzieblik, 2017)



Lower pain scores during activity when supplemented with FORTIGEL®

Zdzieblik and team conducted another study of FORTIGEL®, with a similar study design but with a larger population of subjects with activity-related knee pain. In this trial, significant reductions in pain, depicted by visual analogue scales, were observed by both subjects ($p<0.004$) and study physicians ($p<0.001$) (Zdzieblik, 2021).

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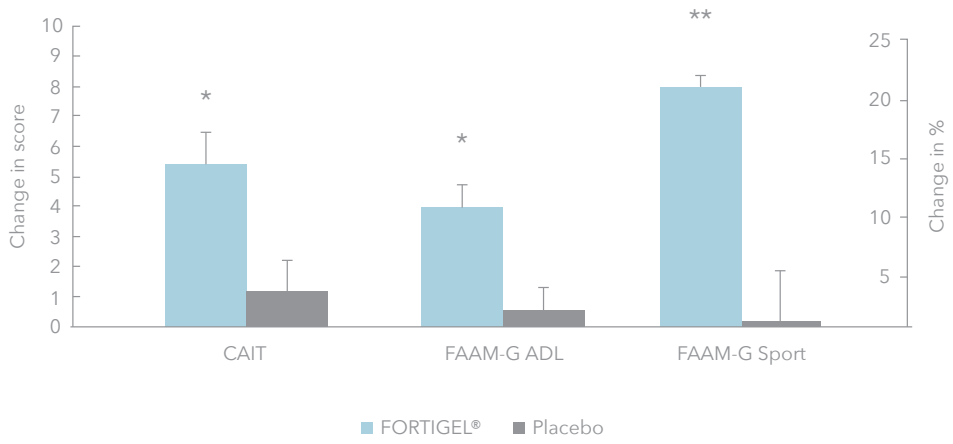
Chronic ankle instability (CAI) is commonly experienced following ankle sprains or strains. Investigators evaluated the effect of FORTIGEL® in 60 individuals with CAI using a randomized, double-blind study design. Subjects received either 5g of FORTIGEL® or a placebo daily for 6 months. Three tools addressing ankle stability were used to measure CAI before and after treatment. These were the Cumberland Ankle Instability Tool (CAIT) and two adaptations of the German version of the Foot and Ankle Ability Measure (FAAM-G): activities of daily living were distinguished by the FAAM-G ADL tool and sports exercise abilities were assessed using the Foot and Ankle Ability Measure for sports exercise (FAAM-G sport). Ankle stiffness was examined by an ankle arthrometer. After 6 months, the group receiving FORTIGEL® had significant improvements across all three scoring tools. No difference was seen in ankle stiffness between groups (Dressler, 2018). The change in scores for the CAIT, FAAM-G ADL, and FAAM-G sport are presented in Fig.5. Higher scores indicated greater ankle stability.

Fig. 5 Improved ankle stability with FORTIGEL® (Dressler, 2018)



*Significant improvements in CAI measures with FORTIGEL vs placebo. *p<0.01 **p<0.001*

In a three-month follow up to supplementation, there were significantly fewer ankle injuries and sprains in the group that had received FORTIGEL® vs the placebo group. The FORTIGEL® group also had continued improvements in ankle stability, significantly more so than the placebo group.

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