

SOLU·GEL[®]
collagen peptides

**SPORTS
NUTRITION**

The natural solution for your
**SPORTS NUTRITION
& ACTIVE LIFE**




PB LEINER
The Clear Solution

A woman in an orange sports bra and black shorts runs alongside a man in a blue tank top and black shorts. They are running on a paved road with a concrete barrier in the background under a clear blue sky.

SOLUGEL® FOR SPORTS NUTRITION

The global sports nutrition market is growing

The global sports nutrition market is expected to reach USD 24.43 billion by 2025, expanding at a compound rate of 9.7%.¹ One of the main reasons for the rapid growth in sports nutrition is the broadening consumer group – the market traditionally focused on niche segments, targeting professional athletes and sports enthusiasts, is now extending to mainstream markets, ranging from those who pursue sports as a hobby, to lifestyle non-athletic consumers and even the aging population.

Consumers are increasingly looking for nutritional products tailored to their specific athletic requirements to excel in fitness and performance, and there is also more of a focus on health, wellness and convenience.

Collagen peptide, a unique protein for sports nutrition

One of the most known nutrients in sports nutrition is protein, which accounts for almost 58% of the total market².

Present in every cell, tissue and organ in our bodies, proteins are constantly being broken down and replaced. The body does not store protein for later use, which makes it necessary to consume adequate high-quality protein.

Proteins are composed of amino acids, which are linked together in different patterns to form specific proteins with different characteristics. There are twenty different amino acids, of which nine are considered essential because they cannot be synthesized by the body.

In nature, proteins can be found in plants and animals. Studies have proven that proteins sourced from animals have multiple benefits over plant-based proteins, including better digestibility, growth performance, and gut health³.

As the most abundant protein in mammals, collagen connects and supports body tissues, such as tendons, muscles and cartilage. It makes up about 30% of the body's protein and over 28 different types of collagen have been identified. By breaking down the collagen enzymatically into smaller molecular peptides, collagen peptides are obtained. These bioactive peptides can be easily digested and quickly absorbed in the blood stream.

Consisting of a combination of amino acids, SOLUGEL® is a high-quality collagen peptide obtained from natural animal sources (see figure 1). It is a pure protein and an ingredient of natural origin, which can be easily used in a wide range of nutritional applications, such as sport drinks and cereal bars.

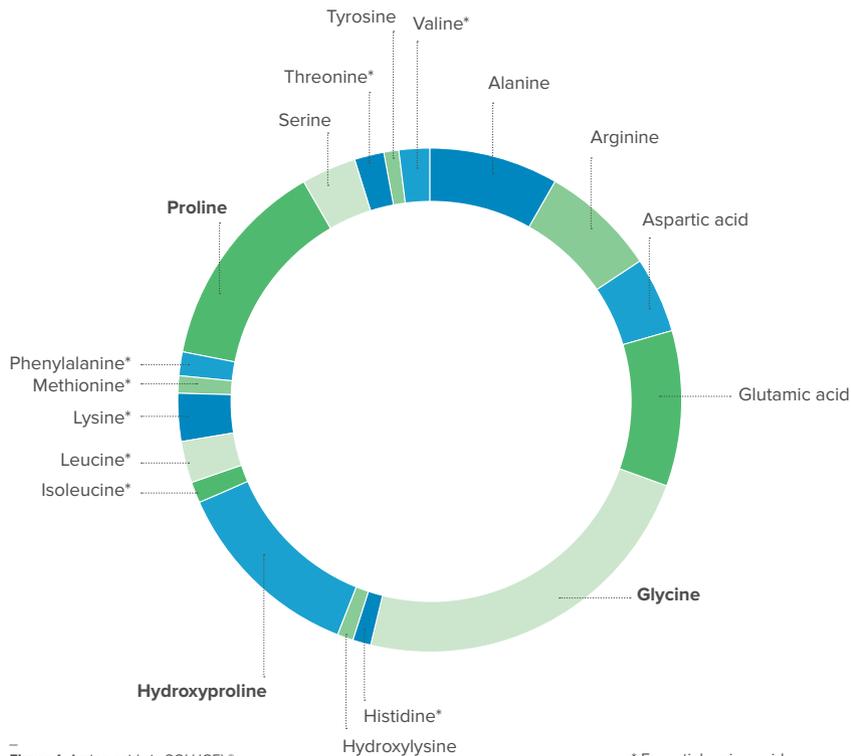


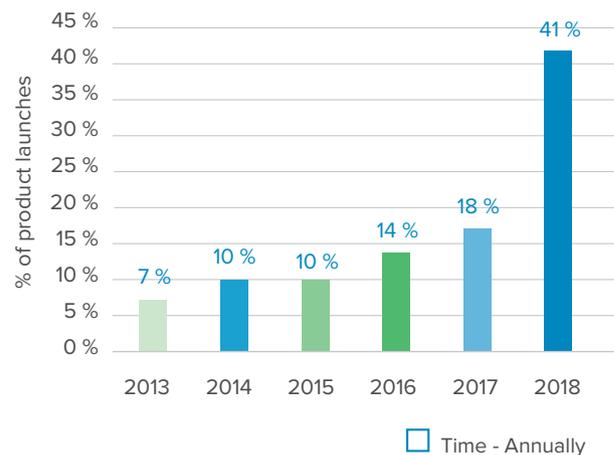
Figure 1 Amino acids in SOLUGEL®

* Essential amino acid



Collagen in sports nutrition is experiencing a rapid growth

Collagen is becoming increasingly popular as a protein ingredient used in sport nutrition. According to Innova Market Insights, there has been a steady rise in product launches in the sports nutrition market featuring collagen, and 2018 saw a dramatic increase in the products featuring collagen (over 40% more products were launched compared to 2017).



Source Innova Market Insights: Product launches in sports nutrition featuring collagen

SOLUGEL® FOR PHYSICAL PERFORMANCE

Multifunctional proteins

Protein is one of the most popular dietary supplements marketed to athletes and active individuals, because of its ability to enhance performance in various ways. During exercise, proteins can provide energy, and specific proteins, such as collagen peptides, act as protective agents for the joints and tendons. After exercise, it contributes to the regeneration of muscle tissues, and supports post-exercise tissue recovery⁴.

Helps to improve and maintain physical performance

Creatine is naturally produced in the human body from the amino acids glycine, arginine and methionine. It supports muscular contraction during periods of high-intensity exercise. Collagen offers high concentration of glycine and arginine, which boost creatine production in the body, suggesting to help maintain or even improve performance for longer periods⁵.



Muscle recovery and regeneration

In daily life, proteins in the body are continuously broken down and regenerated. During sport, protein breakdown is more pronounced than protein synthesis. Branched-chain amino acids (BCAAs) increase the protein balance by decreasing the rate of protein breakdown and/or by increasing the rate of protein synthesis^{6,7}, particularly when it comes to leucine⁸. Glutamine, present in collagen peptides, may also promote muscle-glycogen synthesis and potential enhancement of muscular strength⁹. According to an in vitro study, specific collagen-derived peptides might help to maintain muscle tissue by inducing differentiation and hypertrophy in skeletal muscle cells¹⁰.

These findings prove that the specific amino acids present in collagen peptides could have a beneficial effect on muscle recovery after exercise. Another study demonstrates that collagen peptides have a potent antioxidative activity^{11,12}, which could play a role in maintaining the muscle integrity in addition to other benefits.

Support healthy joint structure and functions

Collagen peptides also have positive effects on maintenance of healthy structure and function of joints.

Physical activity is known to increase type I collagen synthesis in peritendinous tissue, which has an important role in force transmission^{13,14,15}. A study has shown the potential benefits of collagen peptides in individuals with joint pain associated with sports who had not been diagnosed with a medical disorder.

The result provides data supporting the view that collagen peptide as a nutritional supplement (at 10g/day) may be administered to athletes to reduce the symptoms of joint pain associated with athletic activity¹⁶. A combination of hydrolyzed collagen and vitamin C could be a potential supplement supporting recovery during highly intensive competition periods and it might also might help to maintain connective tissue integrity.^{17, 18, 19}. Vitamin C is a cofactor for collagen synthesis, meaning that it must be present in different steps of the process to make collagen synthesis possible, but also to achieve the best configuration of the molecules. A combination of SOLUGEL® and vitamin C can boost collagen synthesis, making it more efficient and helping to protect tissues and joints during intensive exercises.



SOLUGEL[®] HELPS TO MANAGE YOUR WEIGHT

Obesity and overweightness

Worldwide obesity has nearly tripled since 1975 and in 2016, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 650 million were obese ²⁰.

Once considered a problem only in high-income countries, obesity is now dramatically on the rise in low and middle-income countries, particularly in urban environments ²¹.

Being overweight or obese can lead to many other health problems, such as high blood pressure, diabetes, coronary heart disease, stroke and also various forms of cancer. Increased consumption of carbohydrates from foods and drinks with a high glycemic index is widely believed to be contributing to the global obesity pandemic.

Long-lasting satiety

It is known that low-carbohydrate and high-protein diets favorably affect body mass and composition independently of energy intake ²². In addition, the combination of a specific diet and athletic activities could help to lose weight and body-fat mass ²³. Several in vivo experiments on rats show that protein is clearly more satiating than other macro-nutrients due to its activation of several specific neuronal transmitters involved in satiety ^{24,25}.





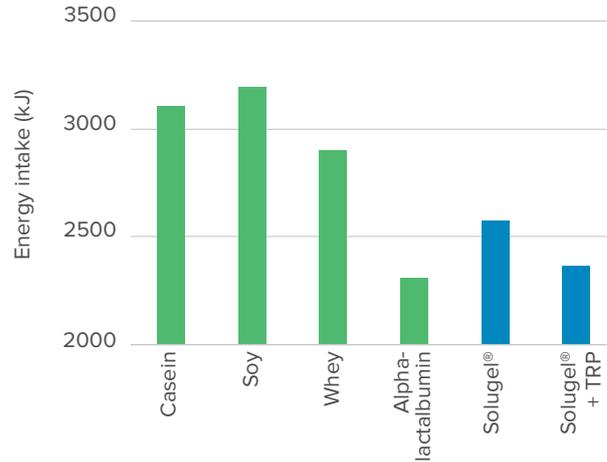
Scientifically-proven SOLUGEL® effects

A clinical study, conducted with SOLUGEL® collagen peptides, evaluated the effect of casein, soy, whey, alpha lactalbumin, collagen peptides and collagen peptides + tryptophan (TRP) in two concentrations (10 and 25%) during breakfast. The effect was measured by the energy intake at lunch, which was offered 3 hours after breakfast. The study involved 30 healthy male and female volunteers with a normal weight and between 18 and 45 years old. Breakfasts containing SOLUGEL® and SOLUGEL® + TRP caused a significant ~20% lower energy intake at lunch compared to casein and soy breakfasts at both protein concentrations (see figure 2 and 3). The reduced energy intake of 20% was related to a ~40% reduction in appetite²⁶.

Scientific evidence proves that SOLUGEL® outperforms other proteins by providing long-lasting satiety and delaying hunger. SOLUGEL® is the ideal protein source for your weight management diet^{26,27}.

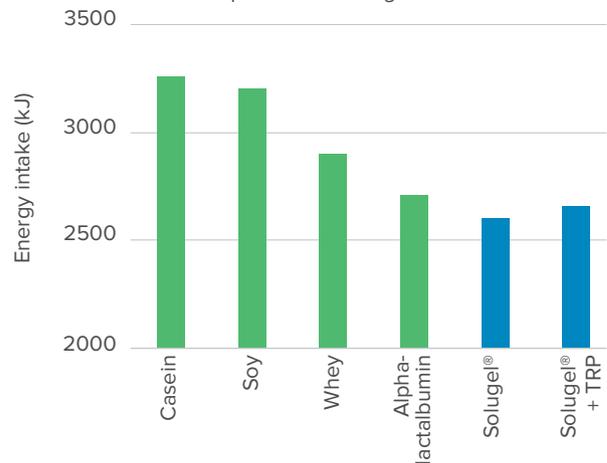
Protein concentration 10%

Equivalent to ≈ 15g SOLUGEL®



Protein concentration 25%

Equivalent to ≈ 39g SOLUGEL®



SOLUGEL® FOR YOUR HEALTHY LIFESTYLE

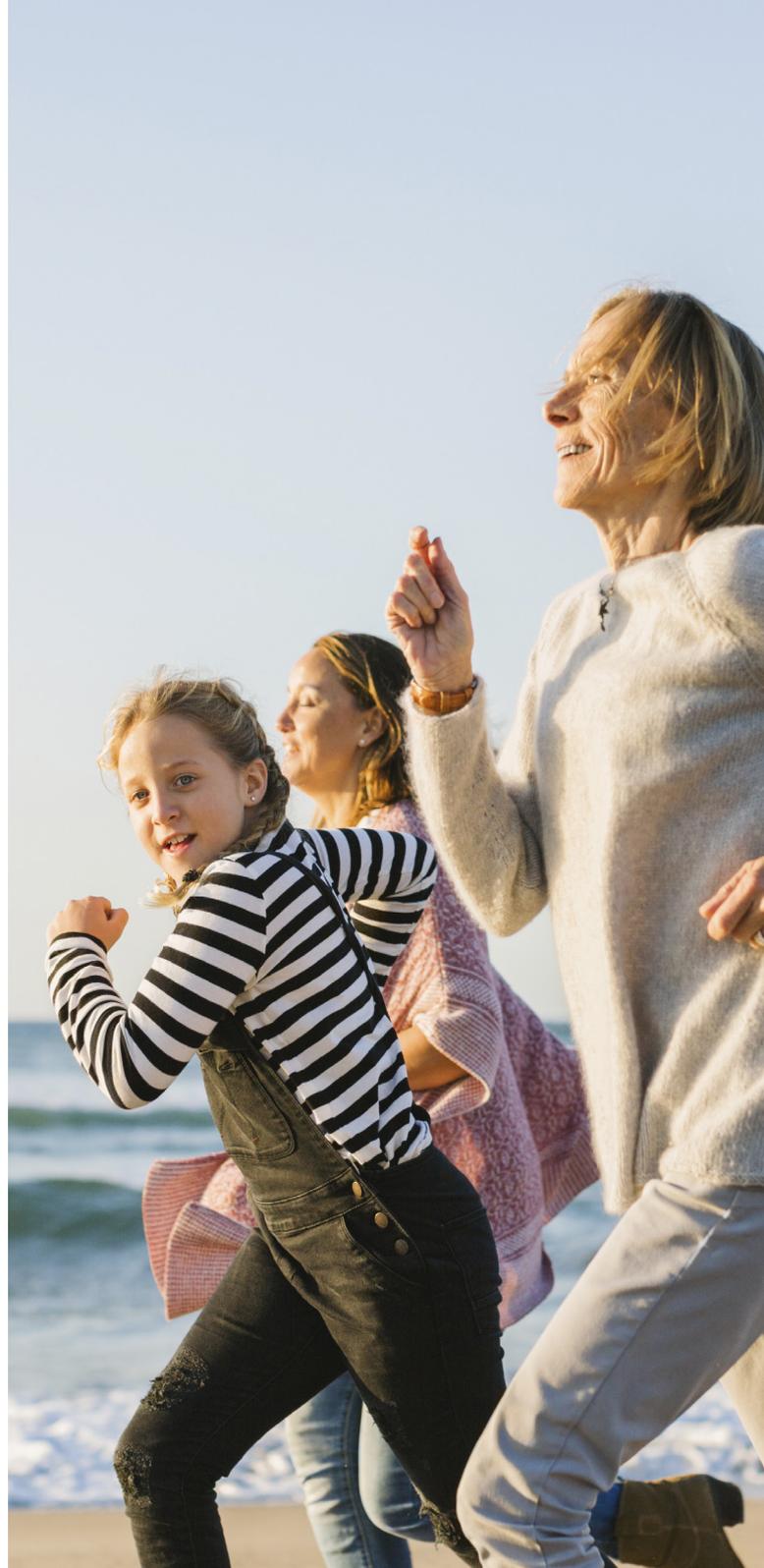
Diabetes and low glycemic index

Type 2 diabetes is a chronic issue that occurs when the body cannot effectively use the insulin it produces to regulate blood sugar. It comprises 90% of people with diabetes around the world, and is largely the result of excess body weight and physical inactivity²⁸.

Proteins help to reduce energy intake and maintain a healthy blood glucose level, which has a favorable impact on weight management.

When broken into smaller peptides, protein hydrolysates can be absorbed much faster than intact proteins causing a strong insulinotropic effect⁽²⁹⁾. Specifically in studies with collagen peptides-enriched diet, insulin response by the body was associated with increased concentrations of leucine, phenylalanine and tyrosine concentrations in plasma. This observation shows the positive effect of the collagen peptides-rich diet to better regulate the blood sugar concentrations.^{30,31}

Collagen peptides- enriched diets could support healthy blood sugar levels by avoiding glucose peaks in the blood.





**NEUTRAL
ODOR AND
FLAVOR**

Hypertension

Food and food supplements containing angiotensin I-converting enzyme (ACE) inhibitor peptides may be part of an active lifestyle approach.³² Collagen peptides also have an antihypertensive effect in the body as they contains ACE-inhibitor peptides which support maintenance of healthy blood pressure levels.^{33,34}

SOLUGEL® Performs

SOLUGEL® are high-quality collagen peptides containing a unique combination of amino acids. Scientific studies suggest that collagen peptides are more satiating than vegetable protein which can help in losing weight. It could also help to control the blood-sugar level by avoiding glucose peaks in the blood and could help physical performance by delaying fatigue, sustaining the immune system and producing muscle tissue.

As a pure protein, bioactive SOLUGEL® can be easily digested and absorbed by the body, making it an ideal ingredient for sports and active lifestyles. It can be quickly dissolved in water and has a neutral odor and flavor.

SOLUGEL® is available with different functional properties and can be based on different raw materials, which include halal and kosher and pasture-raised products. High-protein concentrations can be achieved with low viscosity, so SOLUGEL® is ideal for beverages, bars, confectionery and instant preparations, adding value to your various applications, from food supplements to nutrient-enriched foods.

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More information on scientific studies available on request.

SOLUGEL[®]
collagen peptides



Brings elasticity, smoothness and hydration to the skin

SOLUGEL[®]
collagen peptides



Helps maintain strong bones and healthy joints

SOLUGEL[®]
collagen peptides



Offers a unique combination of amino acids for sports and active lifestyle



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