

PEPTAN[®] FOR HEALTHY AND ACTIVE AGING



Collagen Peptides for a Healthy Lifestyle

PRODUCED & MARKETING BY ROUSSELOT

Peptan[®]

DARLING
INGREDIENTS

Aging, a worldwide concern and a major opportunity

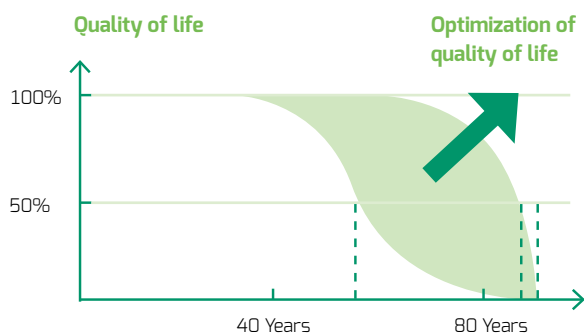


By 2050, around a quarter of the world's population will be 60 years or older, according to a recent United Nations prognosis. Many of these men and women are raising their expectations of remaining healthy and active. But the fulfilment of these expectations cannot be taken for granted. While more people are reaching higher ages, the number of years in which they enjoy good health is not growing as fast, researchers at the University Medical Center Groningen, the Netherlands say. With advancing years come many problems related to joints, bones and muscles. Such conditions can restrict or prevent easy movement, making older men and women less independent and reducing their overall quality of life. On top of this mobility restriction comes the societal burden of rising healthcare expenses.

Science increasingly holds out the promise of a healthy, active and fulfilling 'golden age'

In recent years, consumers have become highly knowledgeable about health stoppers and boosters. Because of this, more and more aging individuals are deliberately making lifestyle decisions regarding diet, exercise and social activities aimed at staying mobile and prolonging healthy life years.





Modified from WHO/HPS, Geneva 2000

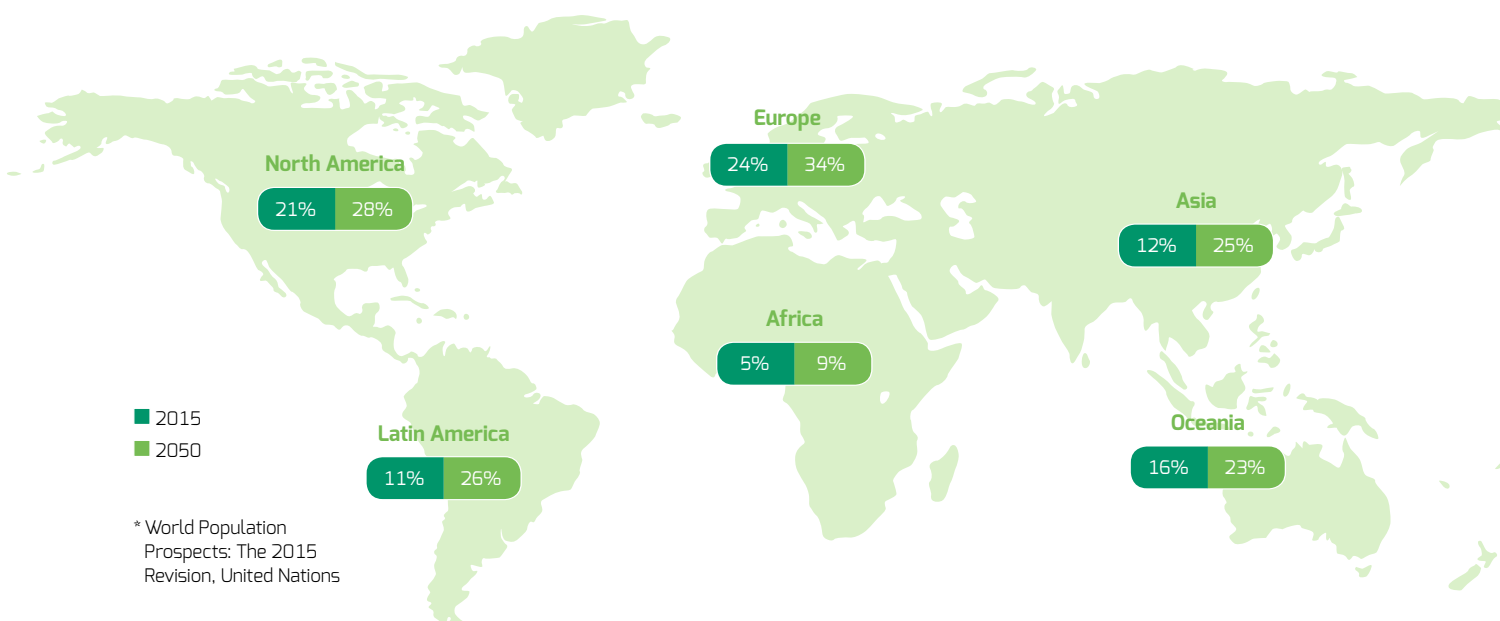
As ongoing research delivers more and more insights into healthy aging, this trend offers immense opportunities for societies, governments and organizations to avoid healthcare costs and to offer older people a better chance to a healthy, active and fulfilling 'golden age'.

Senior nutrition offers exciting business opportunities

Not surprisingly, the healthy aging trend offers exciting business opportunities. Health Focus International reports that 48% of consumers have a strong interest in health products that will benefit bone, joint and muscle function. According to Euromonitor, global sales of products positioned as bone and joint health solutions amounted to US\$16 billion in 2015. Sales of supplement nutrition drinks targeting elderly consumers were worth US\$1.4 billion in 2014 in West Europe and North America.

In Asia Pacific, bone- and muscle-related supplements are the health market's leading segment in terms of value. Julian Mellentin, author of '10 Key Trends in Food, Nutrition and Health', states that senior nutrition is the biggest trend in the market, after the increasing demand for natural or naturally derived products (New Nutrition Business, November/December 2015).

” In 2050, 44% of the world's population will live in relatively aged countries, with at least 20% of the population aged 60 or over*. An exciting market opportunity.



Healthy agers want scientifically based support for their personal decisions

As the number of older consumers rises around the world, the market for products supporting healthy aging and mobility will also prosper. Importantly, these healthy agers are not looking for 'miracle solutions', a 2016 consumer study led by Healthy Marketing Team has shown. Rather, they are seeking support for their health-oriented lifestyle decisions. They want to make choices backed by transparency and scientific evidence.

This means that as a manufacturer operating in the senior nutrition market, you will have to place ever higher demands on the quality, safety and natural origins of the ingredients you use – and on the science behind it all.



At 60+ years, statistics* show:

” 30% of people are affected by loss of muscle mass and strength.



” 20% of all women suffer from joint problems.

1 in 3 women will experience bone fractures.”

” 10% of all men suffer from joint problems.

* International Osteoporosis Foundation Fact Sheets



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In addition to the wealth of clinical information available on Peptan, Peptan experts have helped us in our communication strategy by addressing our clients directly in special workshops.

Matti Kaarlas, Export Director & Production Manager,
Hankintatukku OY

One of the secrets behind our physical health and vitality is a protein

One of the secrets behind our bodies' health and vitality is the collagen we produce. Collagen is a key structural protein that ensures the cohesion, elasticity and regeneration of all our connective tissues, such as skin, bones, muscle, cartilage, tendons and ligaments. It also gives our musculoskeletal system its infrastructure, which makes it essential to our mobility.

As the years go by, our collagen levels drop and signs of aging appear

The bad news is that with age our bodies naturally produce less collagen. For most of us, this process begins around the age of 30 and accelerates in our 40s. Collagen makes up 90% of our organic bone mass and 75% of our cartilage and our skin. With less collagen, our bones and cartilage become more fragile. The result is discomfort, a higher risk of fractures, less agility and possible loss of independence. The connective tissue in our muscles also consists primarily of collagen, so a similar effect occurs there. As age brings on a reduction in muscle mass, affecting strength, tone, flexibility and balance.

Our natural loss of collagen can be compensated for with nutrition

So the natural decline of collagen production affects our skin, joints, bones and muscles, making us painfully aware of the passing of the years. The good news is that this loss can be compensated for: numerous scientific studies have proven that taking collagen peptides can effectively support joint, bone and muscle health all at once. Regular exercise, of course, has long been recognized as a leading contributor to our health and wellbeing. Today, we know that taking the right nutrients is equally influential. And that collagen peptides are a key – if not the key – nutritional ingredient that helps maintain mobility.

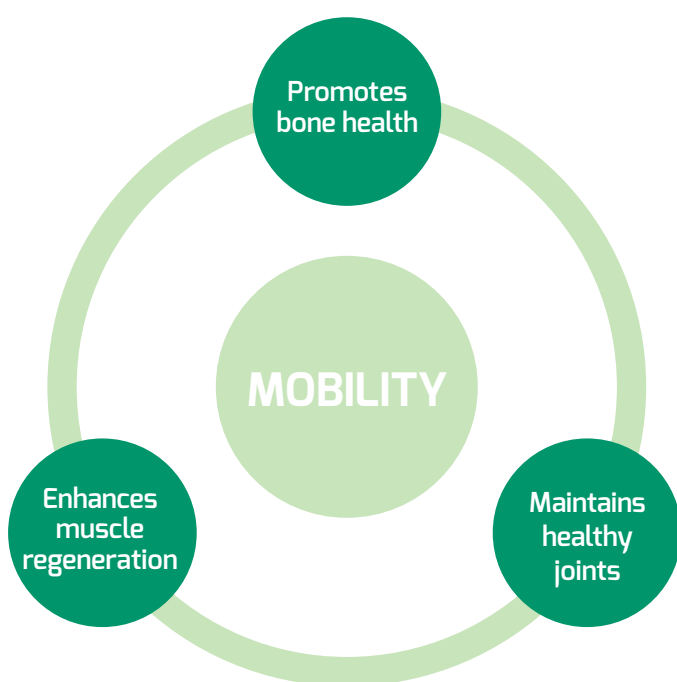


Science's answer to mobility

Peptan is the world's leading brand of collagen peptides. It is a natural, high-purity, bioactive ingredient with a protein content of over 97% (on a dry weight basis).

Our collagen peptides offer the properties and benefits aging consumers are looking for in support of their efforts to live well.

We are eager to help you meet the growing demand for preventive nutrition.



One Peptan, multiple health benefits

A wide range of studies has demonstrated Peptan's ability to promote healthy joints and strong bones, while also supporting lean muscle mass and strength.

Uniquely, this ingredient simultaneously supports all the connective tissues in the consumer's body by stimulating local cells in the target tissues to produce more collagen and other key matrix components.

■ Maintains healthy joints

A daily intake of Peptan collagen peptides has been shown in a randomized, placebo-controlled, double blind clinical trial to reduce joint discomfort and improve joint health¹. Peptan has been proven to stimulate chondrocytes (cartilage cells) to produce more aggrecan and type 2 collagen. These are the two main components of cartilage and healthy joints². A recent *in vivo* study demonstrated Peptan's ability to slow down cartilage degeneration under conditions of induced osteoarthritis. It also stimulated chondrocyte proliferation and proteoglycan synthesis, while normalizing synovial inflammation³, the main cause of joint discomfort.

■ Promotes bone health

In vitro and *in vivo* studies have proven Peptan's efficacy in maintaining a healthy bone metabolism and biomechanical parameters – by stimulating the endogenous production of collagen – while also improving bone mass density and bone strength. An animal study indicated that Peptan collagen peptides help to restore bone mineral density and improve bone micro-architecture and solidity. In a follow-up study, Peptan had the same benefit on bone health in older animals and, importantly,

could exert a therapeutic and a preventive effect^{4,5}. Peptan has been found to trigger osteoblasts (bone-forming cells) and to reduce bone resorption^{6,7}. Combining collagen peptides with calcium⁸ and vitamin D can enhance these bone health benefits.

■ Improves muscle mass

Protein consumption, in combination with exercise, plays a vital role in supporting muscle health. The recommended protein intake for healthy adults is 0.8g/kg body weight per day⁹. However, older people can benefit from a higher intake – while in reality the diets of the elderly often lack protein¹⁰. As a bioactive protein, Peptan can help maintain lean body mass in these older adults. Collagen peptides contain high amounts of the amino acids glycine and arginine, which aid the natural production of creatine in the body, supporting muscular contraction during periods of high intensity exercise¹¹. They also support the body's natural muscle replacement process through a good nitrogen balance, preserving lean muscle mass and increasing muscle strength in older adults¹². Collagen peptide supplementation in combination with resistance training has been shown to improve body composition and increase muscle strength in elderly sarcopenic men¹³.

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A natural, multifunctional, high-impact senior nutrition ingredient



Functional and easily palatable

Functional foods and beverages are gaining ground in the healthy aging segment, especially among older adults who prefer not to take tablets, or have difficulty swallowing. The preference among these consumers for functional foods that taste good, easy to integrate into their daily food and easy to chew are just one of many reasons why Peptan is the bioactive ingredient of choice for an increasing number of senior nutrition manufacturers.

Natural, bioactive and easily digestible

Proteins used for senior nutrition purposes also need to be easily digestible and highly bioavailable to ensure efficient uptake by the body. Peptan offers these properties – without side effects. Research has shown that over 90% of collagen peptides are digested and quickly absorbed after oral ingestion – ready to deliver their benefits to the consumer^{14, 15, 16}.

A unique amino acid composition offering specific benefits

Peptan collagen peptides have a unique amino acid profile, containing high levels of the amino acids glycine, hydroxyproline, proline, alanine and arginine – and thus providing seniors with specific nutritional benefits not found in other protein sources. Peptan can be used alone or in blends with other complementary proteins.

Clean label, free of additives and preservatives

Peptan is a natural, clean label food ingredient, free of additives and preservatives. It is the perfect solution for manufacturers seeking to serve customers in pursuit of an active, healthy and fit lifestyle.



” Using Peptan in our products reinforces their image of quality and reliability.

Miguel Ángel Mas Leal, Manager, Vaminter



Easy to use in many applications

Because of its exceptional organoleptic properties, you can easily incorporate Peptan in a wide variety of functional foods, dietary supplements and nutraceuticals – with little or no impact on taste and texture. Think, for example, of protein drinks, dairy products, soups and gummy-style sweets. A few ideas:



Peptan High-Protein Pumpkin Soup

Combining Peptan, milk and chestnut flour, this easily digestible soup is a natural muscle, bone and hydration booster.

Good4Bone Dairy Shot

Delicious probiotic drink helping to maintain bone health. This delicious, fresh, high protein, probiotic drink packs in all that is good for bones! Peptan ensures the optimal protein to build the bone matrix, supported by calcium and vitamin D. Kefir offers digestive and gut health benefits. One shot contains 15% of RDA in calcium and vitamin D.



Fat-reduced Cream Cheese

A classic with new health benefits for today's oldsters. The ease of integration of Peptan into any standard dairy process, allows for a broad range of applications. This cream cheese with Peptan is a tasty and innovative product, which adds new healthy aspects and benefits to a classic cheese spread product.

Benefit from our (co-)innovation, commitment & world-class expertise

With Peptan, you will have a reliable, closely connected partner

Our global leadership in collagen peptides, combined with our worldwide presence and customer-centric culture, enables us to be a closely connected, reliable partner to you as a manufacturer.

We can help you with virtually any product requirement or innovation you have in mind. Here are some key benefits you will enjoy as you partner with Peptan.



1. Trustworthy, up-to-date science

Peptan offers proven efficacy in extensive in vitro, in vivo and double blind, placebo controlled clinical studies and is recognized worldwide for its unrivalled scientific backing.

We'll help you communicate the science, too.

2. Quality & safety

Peptan is manufactured in-house in state-of-the-art certified plants which meet the highest international food quality standards and ensure traceability of products and processes. A premium quality collagen peptide, Peptan is free from preservatives or additives.

Full control from source to final product.

3. Formulation optimization

Peptan Application centers develop new product formulation concepts and share ideas and recipes. We facilitate the optimal use of Peptan in your applications.

We can help get your product faster to market.

4. Co-innovation

Global network of experts are available to help you develop successful, marketable product innovations with Peptan -- we are happy to co-innovate with you.

Join our Innovation Day to gain insights of the latest marketable innovations.

5. Brand development

We also offer outstanding brand development support. You can benefit from endorsement by Peptan branding and the opportunity to list Peptan as one of the ingredients used in your product.

Contact us to know more about our co-branding program.



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About Rousselot and Peptan:

Rousselot and Peptan are both brands of Darling Ingredients Inc. Rousselot is the global leader¹ of gelatin and collagen peptides. Rousselot's wide range of collagen peptides are marketed under the Peptan brand. We work in partnership with our customers all over the world, delivering innovative and advanced ingredient solutions manufactured through state of the art operations. We help our customers achieve their goals, enabling them to create world class pharmaceutical, food and nutritional products to inspire and excite today's demanding consumers.

¹ Global Industry Analysts, Inc., Gelatin a Global Strategic Business report, Nov 2016

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