

Peptan®

Delivering multiple nutritional benefits

With collagen peptides

Research estimates that the global functional food market will reach a value of at least US\$130bn (approx €104bn) in 2015.¹ The industry continues to go from strength to strength as today's health conscious consumers become increasingly aware of the multiple benefits that nutritionally enhanced foods and drinks can provide. With this wealth of new opportunities, manufacturers are looking for ingredients that can not only deliver the clear health benefits consumers require but can also be cost-effectively and efficiently incorporated into a range of products suitable for a variety of markets.

Collagen peptides – which offer scientifically proven nutritional benefits, from support with joint and bone health, to the promotion of healthier skin – are an example of such an ingredient. Some of the key research demonstrating their effectiveness across a number of consumer health concerns are highlighted below.



Collagen: The body's building block

Collagen is a primary connective tissue protein found in the body. It holds all living tissue together and ensures the cohesion, elasticity and regeneration of skin, cartilage and bones. It is the most abundant protein, representing almost 30 per cent of all human protein content.



Collagen peptides are the hydrolyzed form of collagen and can be manufactured using a gentle enzymatic process. Characterised by a unique combination of key amino acids, such as glycine and hydroxyproline, which provide specific nutritional properties that cannot be found with other protein sources, scientific research has identified a wide range of benefits deriving from this bioactive ingredient.

Unlike native collagen, peptides are highly digestible and bioavailable. Indeed, 90 per cent of hydrolyzates are digested and available within the connective tissues just a few hours after digestion.² This allows the bioactive ingredient to effectively deliver essential peptides and amino acids to the body and stimulate the synthesis of endogenous collagen in tissues such as bones, joints and skin.

Rousselot is a leading global manufacturer of collagen peptides globally and its Peptan® range consists of active peptides from three native sources: fish, pig or bovine. A natural, non-allergenic and clean label ingredient, Peptan can be easily and cost-effectively incorporated into foods, beverages, and nutri-cosmetics, without impacting taste or odour.

Promoting healthy skin

As the main structural element of the skin – accounting for 70 to 80 per cent of skin dry weight – collagen is largely responsible for skin's

characteristics, providing an important network and support structure that ensures skin elasticity, suppleness and hydration. A strong collagen structure is the key to preventing the formation of wrinkles. Collagen fibres, which are constructed within fibroblast cells, are responsible for the maintenance and resistance of the skin tissues. The presence of collagen peptides regulates the activity of fibroblasts in the skin and stimulates the production of both collagen and hyaluronic acid, which is important for skin hydration.³

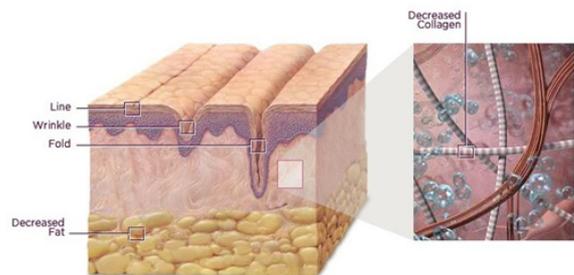


Illustration of skin structure

As we age, the production of new collagen fibres declines as the collagen synthesis by fibroblasts decreases. Collagen in the skin also becomes more and more cross linked and more fragmented. This results in the skin becoming tougher and less able to bind large quantities of water.

Exogenous collagen peptides may act to trigger the synthesis of new collagen fibres by stimulating fibroblast cells.⁴ Studies also show that collagen peptides can improve the mechanical strength of the skin by increasing fibroblasts' density and formation of collagen fibrils in the dermis.⁵

These activities promote younger looking skin and improved suppleness. Clinical trials found that a daily dosage of Peptan collagen peptides increased skin hydration levels by 28 per cent after eight weeks and skin suppleness by 19 per cent after 12 weeks.⁶ And very recently, a new clinical study performed by French laboratory COSderma has demonstrated the restructuring and regeneration of skin collagen with Peptan fish collagen peptides.⁷



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Anti-aging nutrition with collagen peptides

In addition to their skin care benefits, there is convergent scientific evidence that collagen peptides can promote joint, muscle and bone health too, helping to prevent common causes of pain and discomfort. This is of particular interest to today's aging population – given its concern with staying healthy and active for longer – as well as to sports people, as the multiple joint-bone and muscle regeneration benefits offered by collagen peptides offers one effective solution to maintain and improve mobility.

• Reducing joint pain

Extensive research has shown the beneficial effects of collagen peptides in preserving joint health and reducing pain. Following ingestion, collagen peptides rapidly accumulate in cartilage and provide a pool of specific amino-acids to promote endogenous collagen synthesis in the cartilage cells.⁸⁻⁹ This process can act to reduce the cartilage degrading effects of osteoarthritis.

A clinical study with Peptan collagen peptides showed that a daily dose of 8g had a very positive effect on joint pain reduction and improved joint functionality.¹⁰ Numerous clinical trials have confirmed these results. For example Benito-Ruiz *et al.* found a similar dosage significantly improved knee joint comfort.¹¹

• Stronger bones, better density

Collagen, which represents 90 per cent of organic bone mass, has been identified as effective in preventing osteopenia – a condition characterized by low bone mineral density. A 2001 study demonstrated that collagen peptides can stimulate the endogenous production of collagen by bone cells, leading to higher levels of new bone tissue formation.¹² This was confirmed by Guillerminet *et al.*'s 2010 *in vivo* study, which found that Peptan collagen peptides improved bone metabolism and biomechanical parameters.¹³

• Limiting the impact of sarcopenia

To counteract the effects of sarcopenia – the age-related loss of muscle mass – adequate dietary protein must be consumed to produce amino acids for protein synthesis in all tissues. This recommended intake is 1g/kg of body

weight per day – often much higher than in the typical diet of an older person.

Research has indicated that collagen peptides are a protein supplement which maintains nitrogen balance, preserving lean body mass better than equivalent doses of whey protein during the consumption of a relatively low-protein diet.¹⁴

Optimal nutritional support

As a high quality fat- and sugar-free source of protein, collagen peptides are also an effective ingredient for both weight management and sports nutrition.

Various studies have shown that proteins, known to be the most satiating macronutrient, can help reduce food intake and support weight loss.¹⁵⁻¹⁶ Investigations into the specific satiating effect of collagen peptides have found they are even more effective than other protein sources, such as casein, soya or whey.¹⁷ Rousselot's Peptan, for example, can have a significant impact on weight loss, especially when blended with other proteins and combined with decreased sugars and fat.

Multiple studies have also been published on the benefits of bioactive proteins – and collagen peptides in particular – for sports performance and recovery after exercise. In addition to being an effective supplement to help maintain and restore the protein content of muscles following exercise,¹⁸ research has also identified that collagen peptides, such as Peptan, may support the synthesis of creatine (which aids muscular contraction during periods of high intensity exercise) in the body.

Conclusion

Research continues into the potential applications and benefits of collagen peptides. However, the current body of scientific evidence provides a compelling case for their use as a source of functional and nutritional ingredient in a wide range of products which satisfy the requirements of health aware consumers.

For more information

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Rousselot is a leading manufacturer of gelatine and collagen peptides to the food, pharmaceutical and technical industries. Employing 2,400 people, the company benefits from a global sales and production network of 13 plants and 10 sales offices located in Europe, North America, South America and Asia.

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