



A world of potential

Rousselot

| by Darling Ingredients

The science behind collagen for mobility

**COLLAGEN PEPTIDES
FOR MOBILITY**

Science Brochure

rousselot.com/health

PEPTAN® FOR JOINT HEALTH

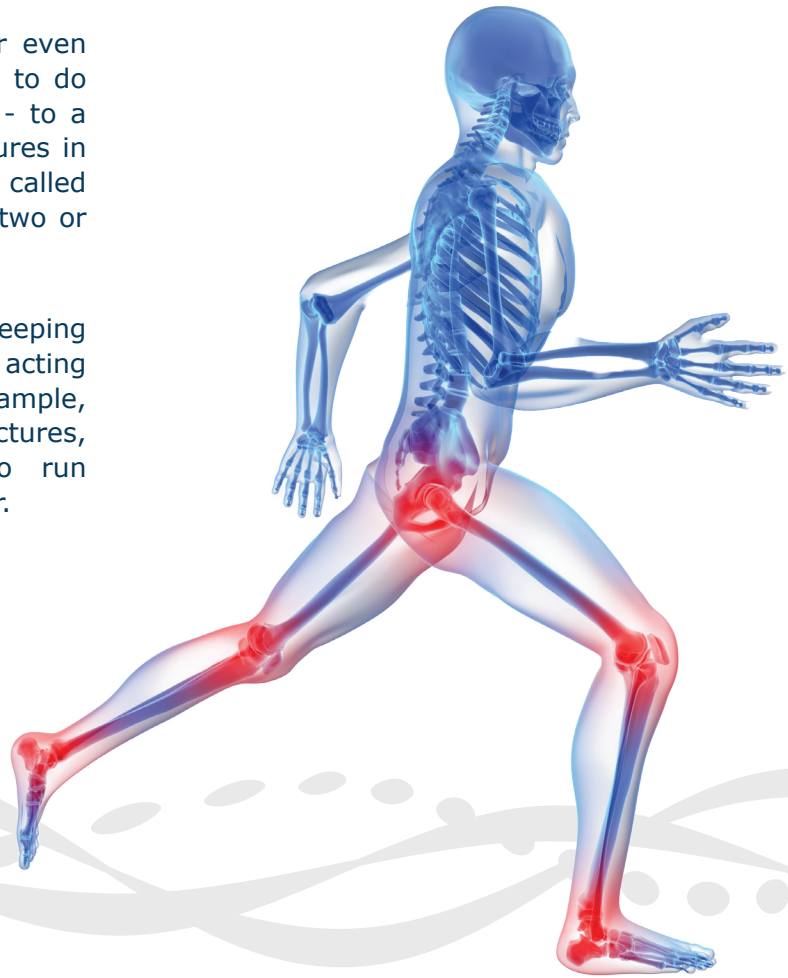


You've got the moves!

Running, cooking, walking the dog, or even reading a book: all the things we love to do require our body to move, bend, and - to a certain extent - be flexible. The structures in our body that make this possible are called joints, which define the area between two or more bones.

Joint cartilage protects our bones by keeping them from scraping against each other, acting as a cushion to minimize impact, for example, when we jump. In between those structures, (synovial) fluids help everything to run smoothly, like oil on a bicycle or in a car.

Peptan



Collagen is a major component of joints; it is responsible for our strength and flexibility. Over time, our body's collagen levels and quality diminish. Why? The balance between synthesis and breakdown of cartilage gets disturbed. This can lead to swelling, pain, stiffness, and bone friction, eventually causing osteoarthritis (OA) or 'wear-and-tear' disease.

TAKING THE LEAP WITH PEPTAN



In one scientific study ^[1], elderly women with mild joint discomfort reported a significant reduction of painful symptoms, like stiffness and pain, after oral intake of Peptan (8g/day) (Fig. 1). These positive effects also improved their mobility and joint function after three months (Fig. 2).

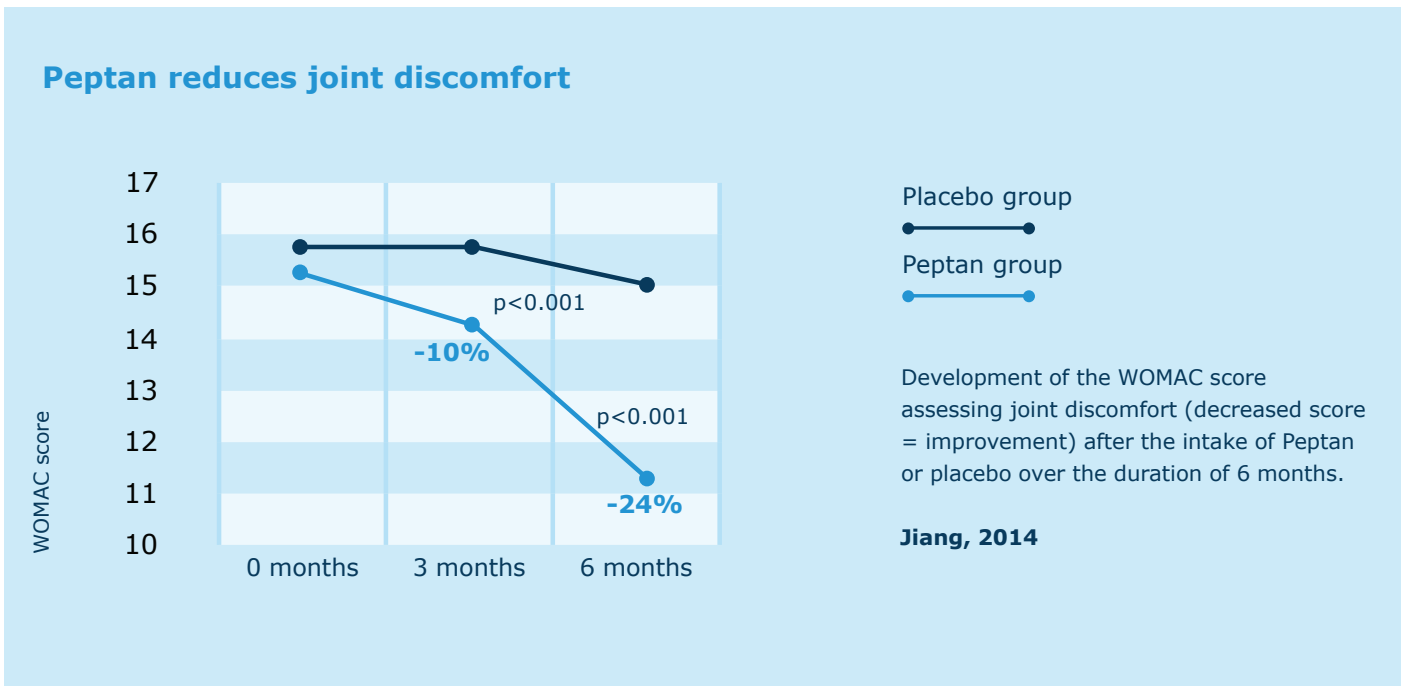


Figure 1: Symptom-relieving effects of Peptan

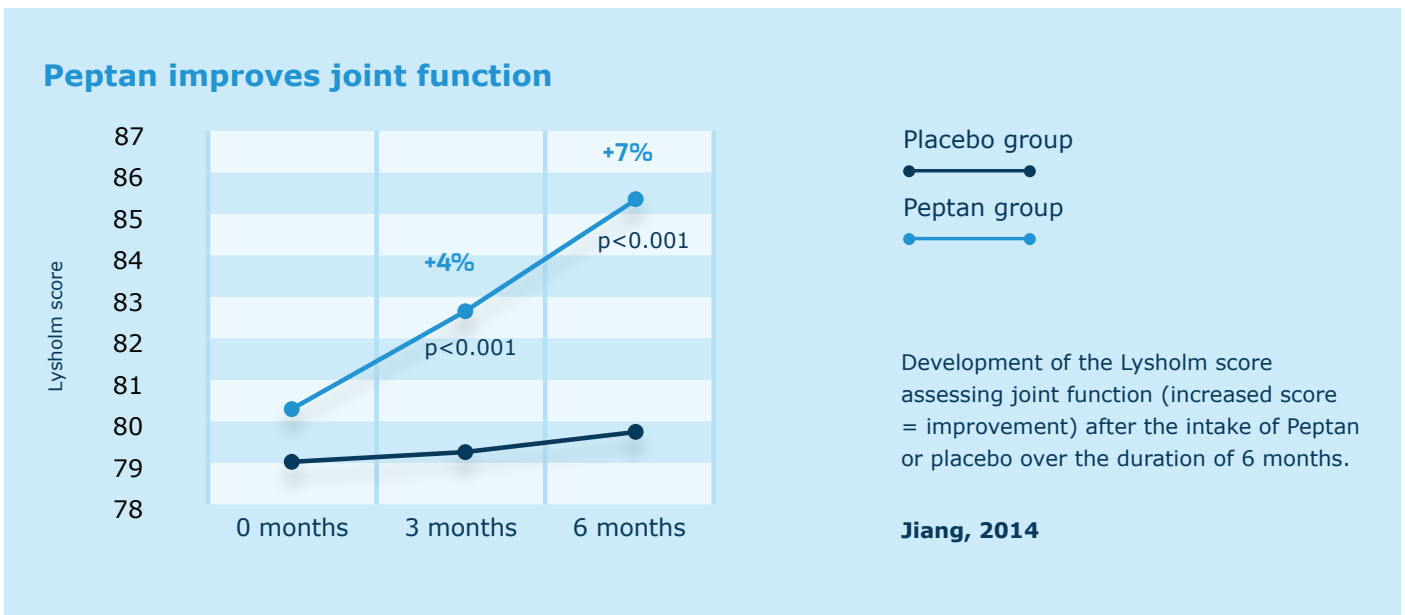


Figure 2: Peptan improves joint functionality

1. Jiang, J., Collagen peptides improve knee osteoarthritis in elderly women. A 6-month randomized, double-blind, placebo-controlled study. *Agro FOOD industry Hi Tech*, 2014. 25(2).

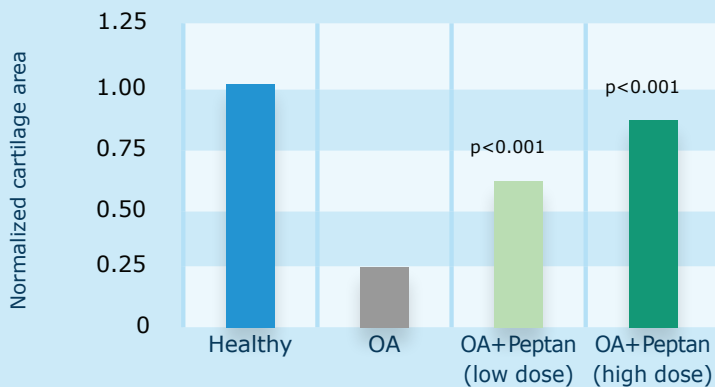
MAINTAINING CARTILAGE, STAYING ACTIVE



Our in vivo study [2] demonstrated that daily intake of Peptan before cartilage damage resulted in cartilage preservation (Fig. 3) and reduced inflammation (Fig. 4) in mice. In the study, the mice that were given Peptan before cartilage damage (green bar), had a higher cartilage area and lower levels of inflammation than the mice that did not take Peptan before cartilage damage (grey bar).

These results indicate that oral consumption of Peptan could have a positive effect on maintaining healthy cartilage.

Peptan prevents cartilage degradation

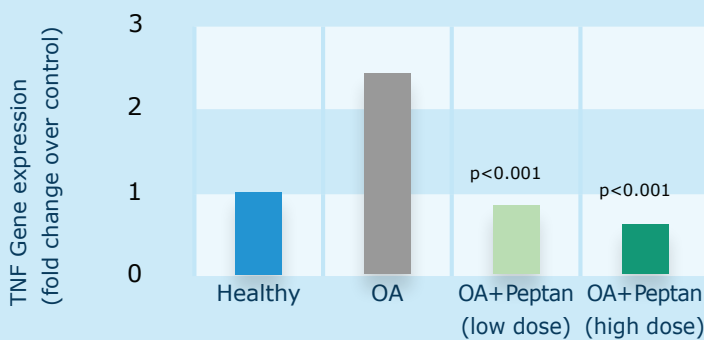


Osteoarthritis (OA) was induced by surgery in mice that received Peptan at two different dosages or a control twelve weeks after OA induction. Histology of the knee joints was performed and the area of the (tibia) cartilage was quantified and compared with healthy animals.

Dar et al., 2017

Figure 3: Oral intake of Peptan before joint damage preserves cartilage in mice

Peptan improves joint inflammation



Three weeks after OA induction the joint synovium was analyzed for the gene expression of inflammatory markers (TNF).

Dar et al., 2017

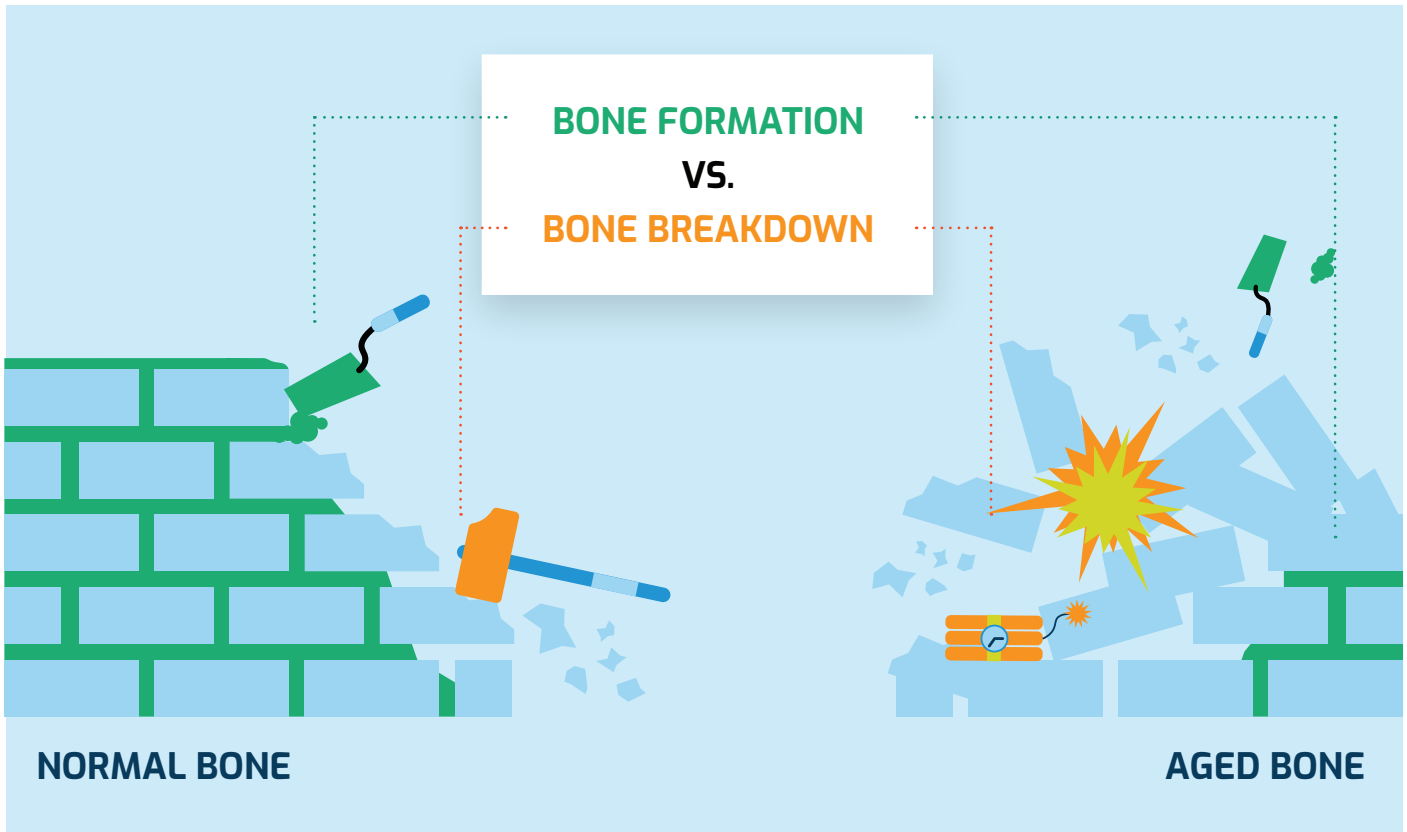
Figure 4: Peptan reduces inflammation in mice

PEPTAN FOR BONE SUPPORT



Bones, a balancing act

Whether we are 25 or 75, mobility is an important part of our lives. Looking after our bones is a vital part of this. Bones give our body the structure and strength we need to keep it moving ^[3]. Many people forget that bones are living tissues that are constantly renewed in carefully balanced processes of synthesis and breakdown, as shown in the image below:



Over time, the balance of our bone metabolism gets disturbed, and bone loss starts to take the upper hand. The amount and quality of collagen diminishes, which can lead to osteoporosis (OP).

OP causes bones to become weak and brittle, leading to discomfort and an increased risk of fracture. One of the main causes of OP is menopause, which explains why more women than men are affected by the disease.

Taking care of our body and bones is vital to staying active, healthy, and mobile as we age.

Peptan for bone support



Our scientific study with Peptan in a mouse model of post-menopausal osteoporosis showed that Peptan collagen peptides can protect against the mobility discomfort caused by collagen deterioration. For the mice in this study, Peptan reduced bone loss (Figure 1) and increased bone density (Figure 2) ^[4,5].

Most surprisingly, oral intake of Peptan, either before or after post-menopausal osteoporosis, resulted in bone breakdown levels similar to non-menopausal mice (healthy).

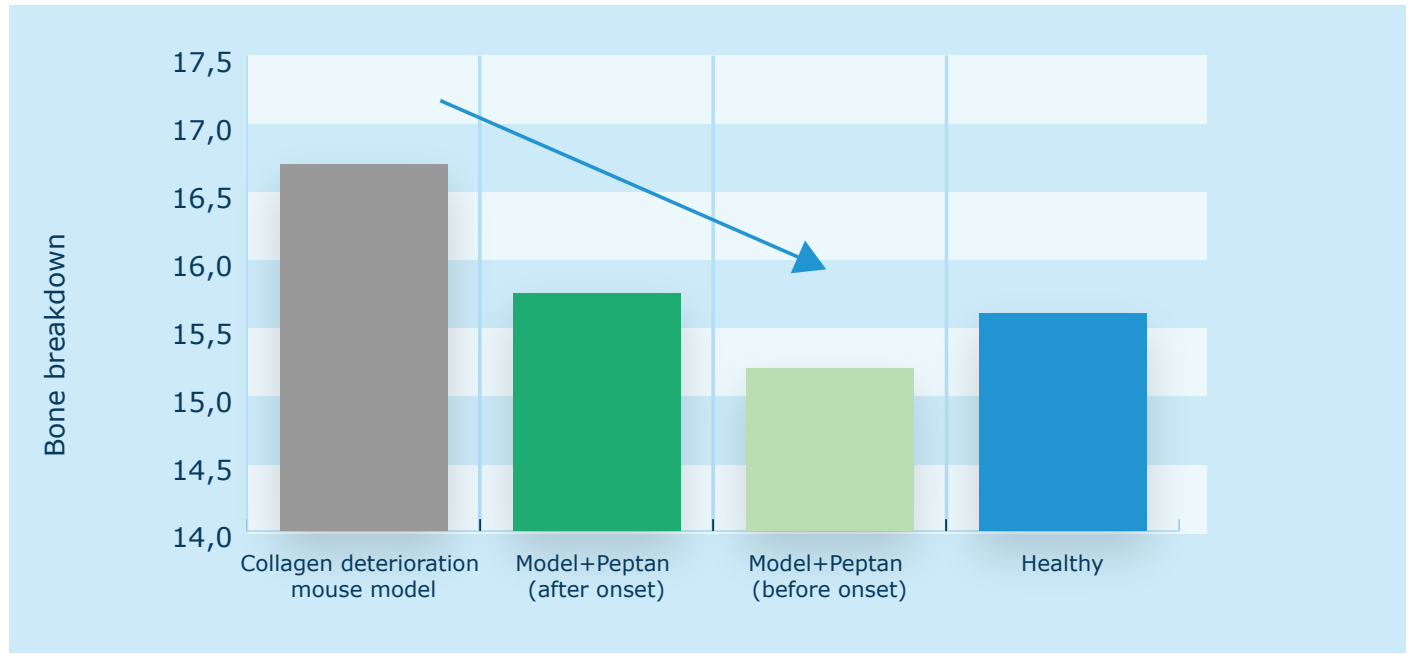


Figure 1: Influence of Peptan on bone breakdown in a post menopausal osteoporosis mouse model

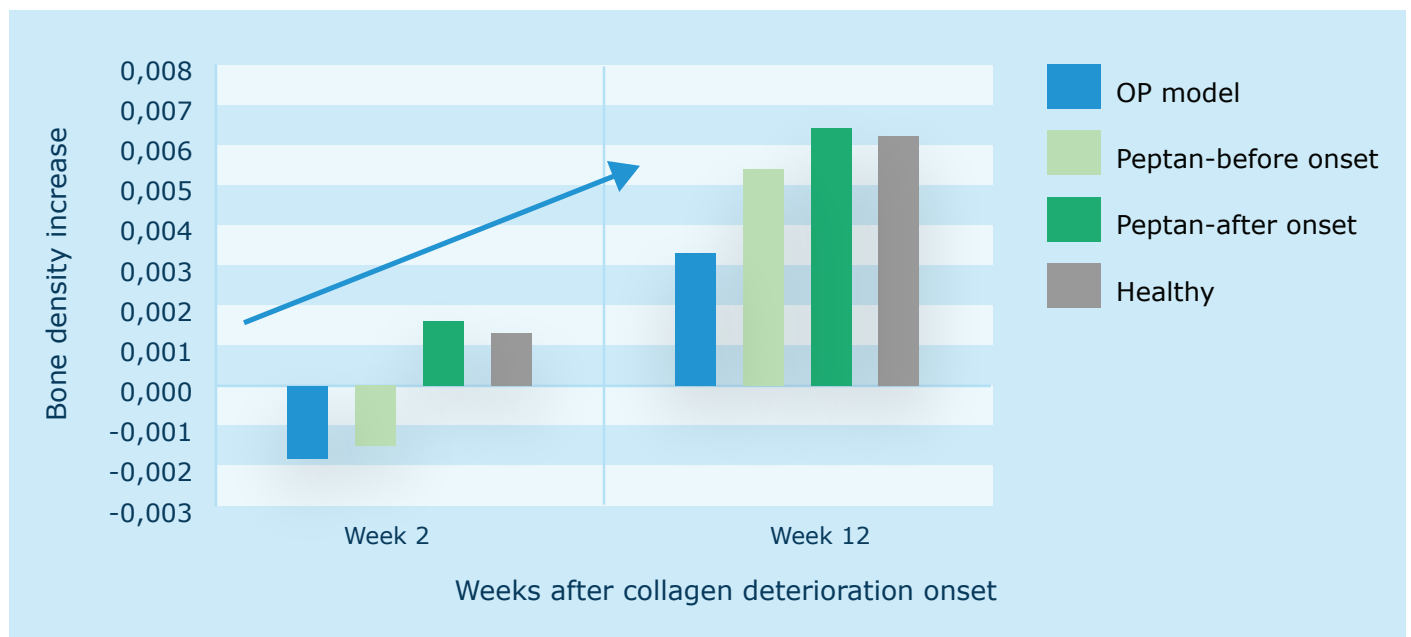


Figure 2: Influence of Peptan on bone density in a post menopausal osteoporosis mouse model

4. Guillerminet, F. et al., 2010, Hydrolyzed collagen improves bone metabolism and biomechanical parameters in ovariectomized mice: An in vitro and in vivo study. *Bone*, 46: 827-834
5. Guillerminet, F. et al., 2012, Hydrolyzed collagen improves bone status and prevents bone loss in ovariectomized C3H/HeN mice. *Osteoporosis International*, 23(7):1909-1919

Peptan stimulates the formation of bone



An in vitro study shows that Peptan collagen peptides have the potential to stimulate bone health (the balance between cell formation and breakdown) in mice even after digestion and absorption by the body ^[6].

These experiments used blood drawn from mice before and after ingesting Peptan to demonstrate that the digested and absorbed collagen peptides can stimulate the generation and growth of cells responsible for bone synthesis (osteoblasts, Fig. 3a), while simultaneously inhibiting the formation of cells that break down bones (osteoclasts, Fig. 3b).

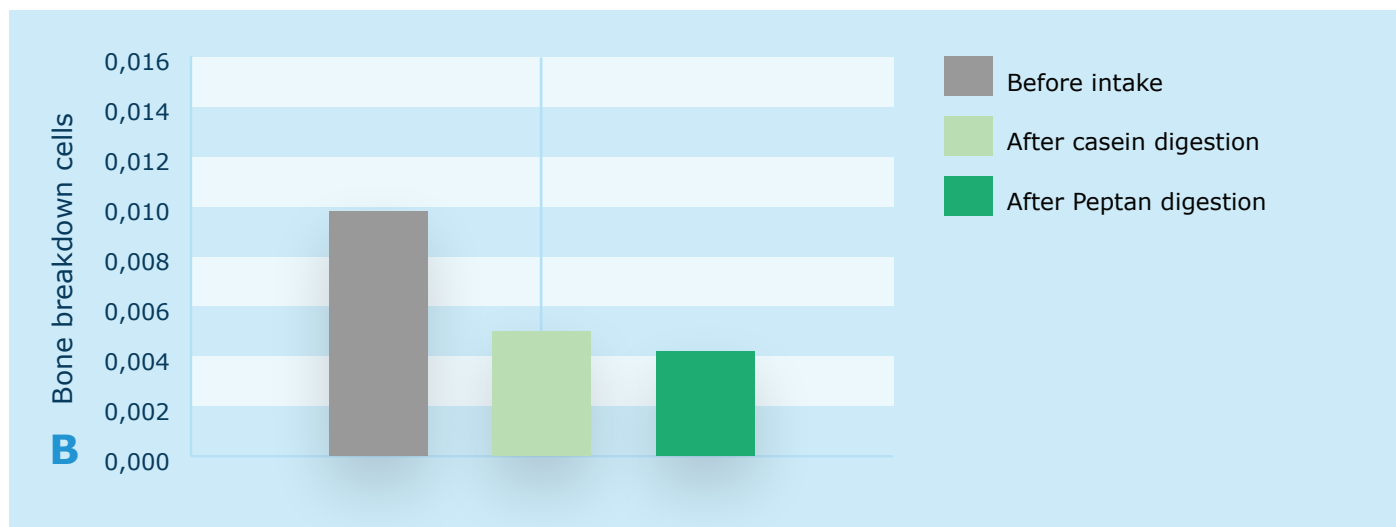
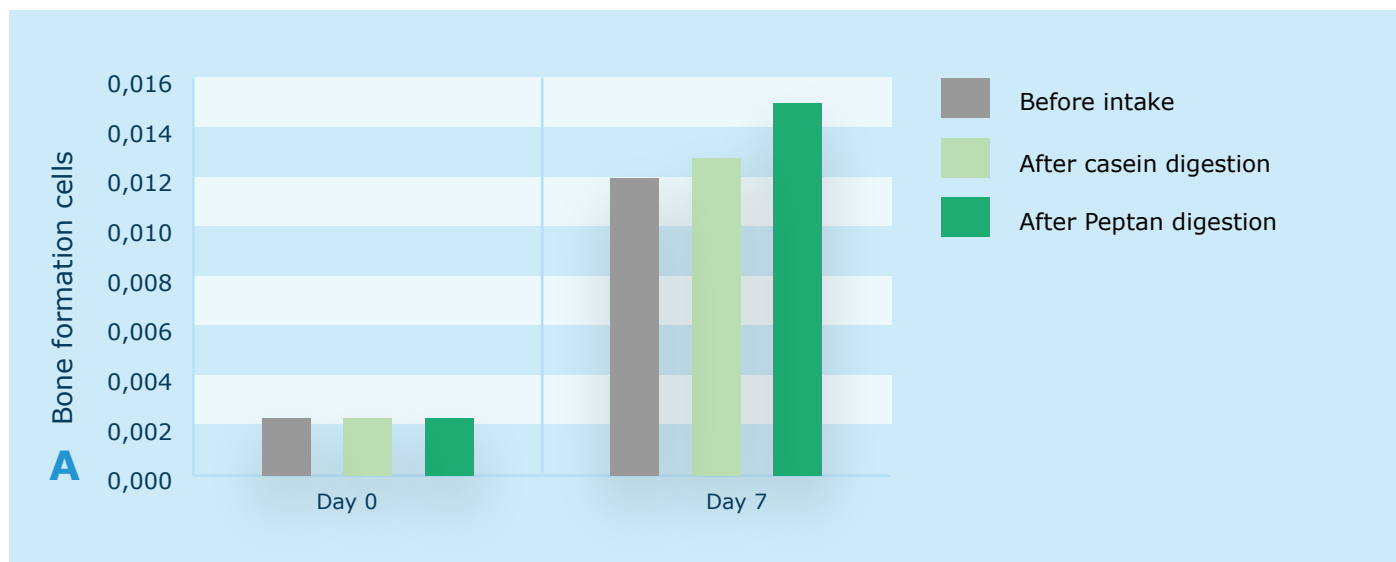


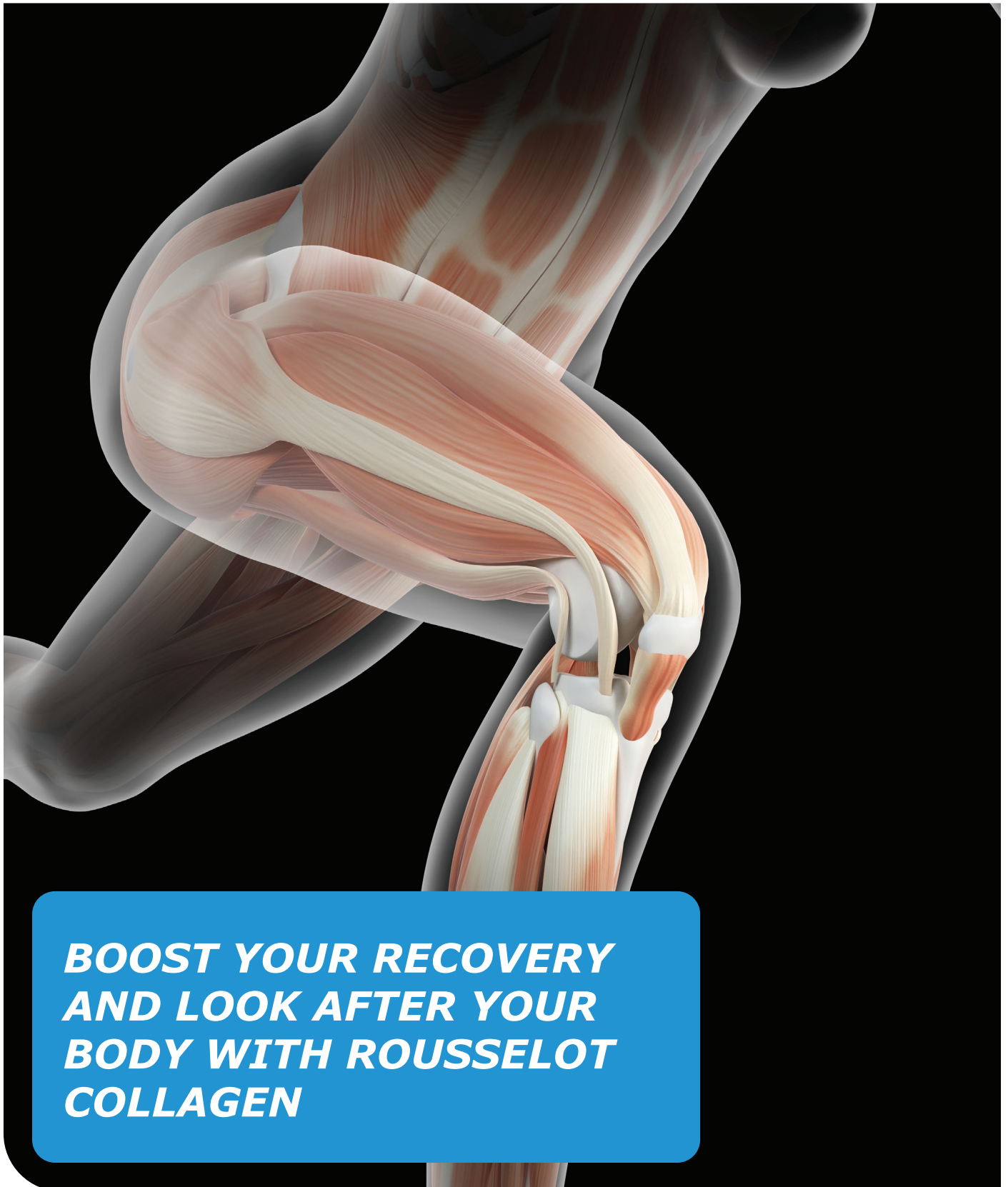
Figure 3: Influence of digested Peptan on the growth of bone metabolism cells in vitro.

- Growth of bone formation cells or osteoblasts.
- Growth of bone breakdown cells or osteoclasts.

PEPTAN FOR MUSCLE HEALTH



As a protein, collagen contributes to the growth and maintenance of muscle mass.^[7] Furthermore, a study in young, healthy, and active males demonstrated that Peptan can stimulate a faster recovery from strenuous exercise and tends to decrease post-exercise muscle soreness as well ^[8].



**BOOST YOUR RECOVERY
AND LOOK AFTER YOUR
BODY WITH ROUSSELOT
COLLAGEN**

7. EFSA Journal 2010;8(10):1811

8. Clifford T. The effects of collagen peptides on muscle damage, inflammation and bone turnover following exercise: a randomized, controlled trial. *Amino Acids*. 2019;51(4):691-704. Epub 2019/02/21. doi: 10.1007/s00726-019-02706-5.

COLARTIX® - COLLAGEN CARTILAGE MATRIX FOR JOINT CARE

Rousselot Health & Nutrition launches its collagen cartilage matrix - Colartix for joint care backed by consumer science.

In a recent placebo-controlled consumer study^[9] involving more than 200 consumers of different genders, all ages and across activity types from gardening, brisk walking to marathon training. A daily intake of 1g Colartix demonstrated a steadily decrease in joint discomfort across gender, age and sport intensity.

Colartix

All genders

All ages

Across activity types from gardening, brisk walking to marathon training

Weekly questionnaire
Physical activity

Type

- Gardening
- Brisk walking
- Running
- Cycling
- Swimming
- Weightlifting
- Flexibility
- Other

Duration (h/week)

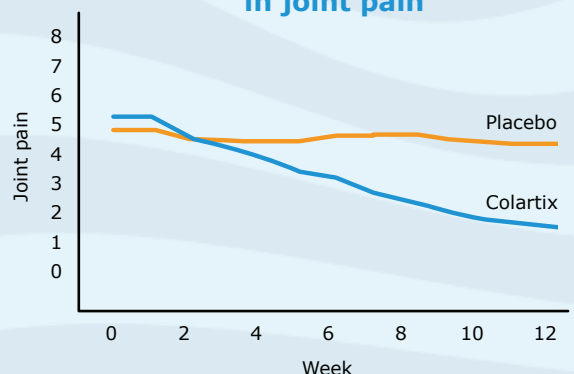
- 0 – 5h
- 6 – 10h
- 11 – 15h
- 16 – 20h
- 20h or more

Supplementation with Colartix demonstrated a steadily decrease in joint discomfort across gender, age, and sport intensity

Changes in joint pain after exercise were assessed by the participants using a Visual Analog Scale (VAS)



Overall reduction in joint pain



Colartix supplemented group reported reduced joint pain after exercise, whilst in the placebo supplemented group joint pain remained steady over time.

9. Newman, C. et al. 2022. The effect of a natural matrix of collagen types and chondroitin sulfate on joint discomfort in physically active adults: a real-life setting study. Submitted to publication.

Complete your product brand story with Peptan and Colartix.

Rousselot Health & Nutrition is a world leader in trusted, science-backed collagen-based solutions. Many of our customers have engaged us in co-developing successful ingredient branding strategies. Selected customers benefit from our endorsement of their products, with access to the Peptan and Colartix brand names and marketing materials.

Rousselot Health & Nutrition can help you with virtually any product requirement or innovation you have in mind, offering:



Transparency



Full traceability



High standards
of quality and safety

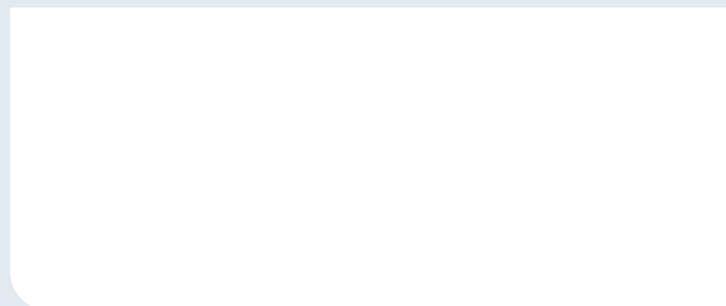


Committed to the
environment and
to our clients



Global support
and expert advice

Your Rousselot sales contact information



Rousselot Health & Nutrition

As Rousselot's strategic segment dedicated to health and nutrition, we are committed to developing innovative ingredients answering today's demand for solutions offering proven efficacy, full safety, and premium quality. Our customers can rely on best-in-class products, backed by trusted science as well as on our expert support in formulation, product development, and regulatory advice. Building on the success of our flagship brand Peptan, our collagen solutions offer a world of health benefits for a healthier tomorrow. Rousselot Health & Nutrition is one of three strategic markets served by Rousselot. Rousselot is Darling Ingredients' Health Brand.

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