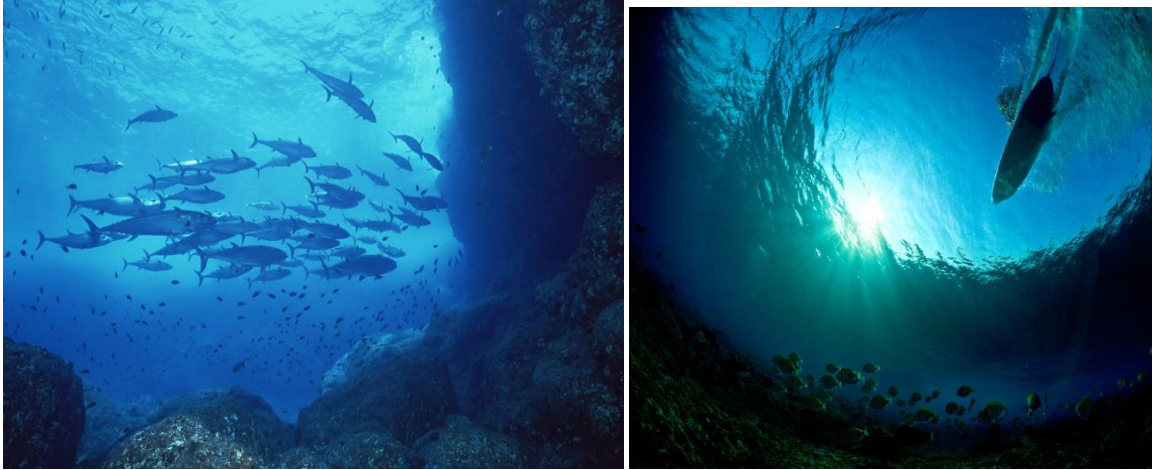


## SmartPEP® **FISH COLLAGEN PEPTIDE**

Supports Healthy Skin, Hair, and Joints. Replenishes Collagen.

### GLOBAL PEPTIDES EXPERTISE



- All-natural, High-quality Bioactive Peptides
- Small, Low Molecular Weight
- Quality Assured and Molecular Size Tested
- Easily Bio-available, Digestible and Soluble
- Clean and Sustainable Sources
- Non-GMO Certified
- Essential, Functional and Beneficial

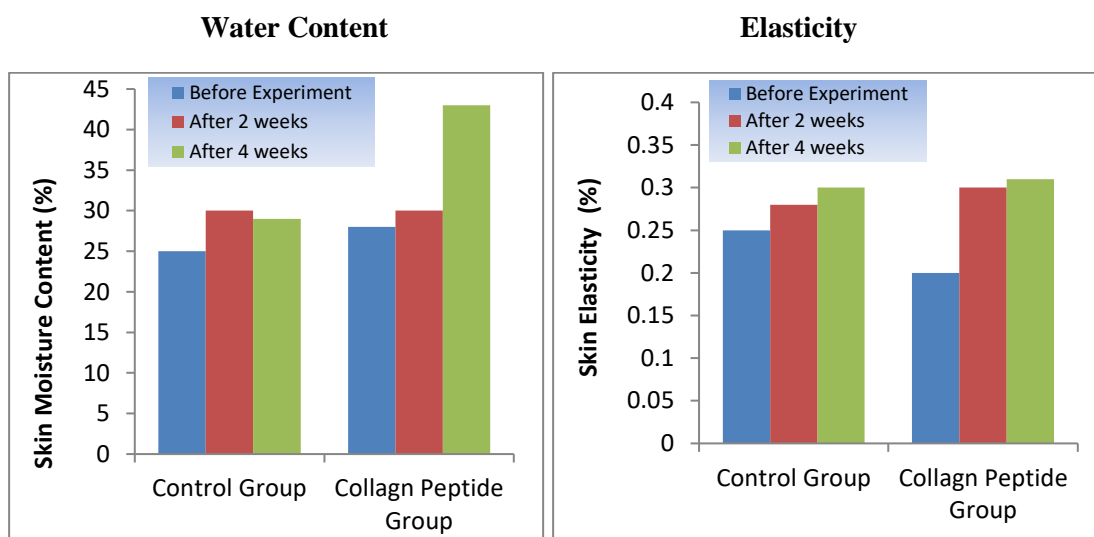
### Product Application Fields

Nutritional Foods/Pet Foods  
Dietary Supplements  
Joint Health Products  
Cosmetics

<b>Shelf Life:</b>	4 years shelf life from manufacturing date when properly stored.
<b>Storage:</b>	Store in tightly sealed containers within a cool, dry facility. Keep away from intense light and heat.
<b>Shipping Conditions:</b>	All our peptide products are shipped at ambient temperature in the original sealed plastic bags/fibre drum package.

## Effects of SmartPEP® Fish Collagen Peptide on Skin Moisture and Elasticity

Collagen is the main structural component of the extra cellular matrix (ECM) in the human connective tissue. Collagen has wide array biomedical applications including wound healing, skin regeneration, and bone and tissue regeneration. Collagen peptide is a natural bioactive ingredient and when supplemented orally improves skin hydration and the collagen dermal network. Yet, benefits of topical application of collagen peptide have not been extensively studied. So here we test a topical skin care product which containing 5% SmartPEP® Fish Collagen Peptide for improved skin moisture and an overarching goal of reducing skin wrinkles and slowing the aging.



Population: Female

Age: between 25-28

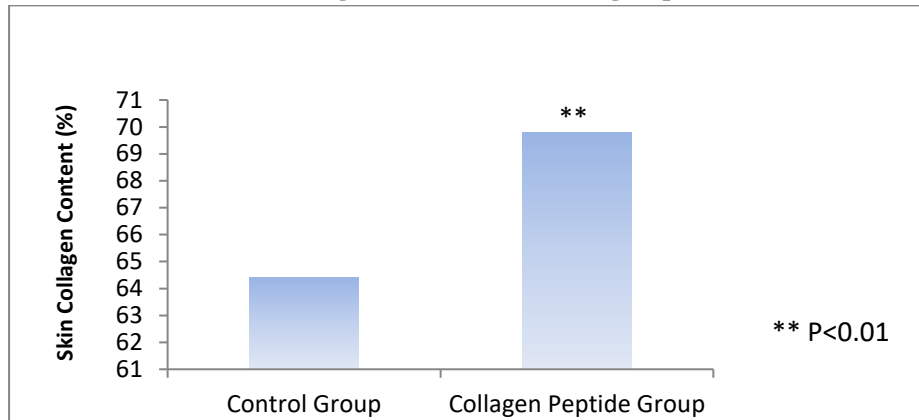
Application per day: 5% SmartPEP® Fish Collagen Peptide

Study length: 4 weeks

Result: After 4 weeks of continuous application of SmartPEP® Fish Collagen peptide, the skin moisture content is significantly improved, and the elasticity is rapidly increased compared to the control group.

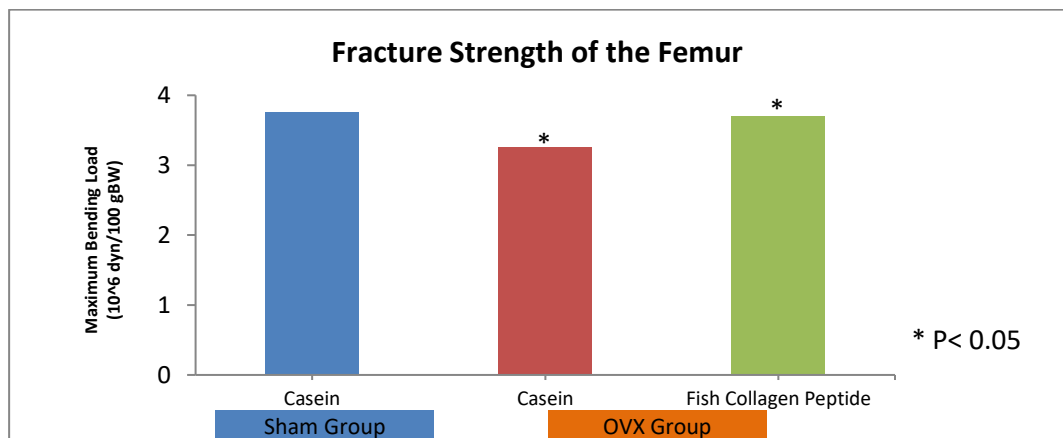
## Increase Skin Collagen Content

Determination of skin collagen content in different group of mice ( $\bar{X} \pm S$ , n=11)



This experiment has proven that SmartPEP® Fish Collagen Peptide is effectively increasing the skin collagen content by mice oral intake for 40 days at a dose of 0.04g/ml.

## Prevention of Osteoporosis (Bone health)



Ovariectomized (OVX) Mice -Model of osteoporosis

Intake: 5% of the amount Feed (SmartPEP® Fish Collagen Peptide)

Ingestion period: 12 weeks

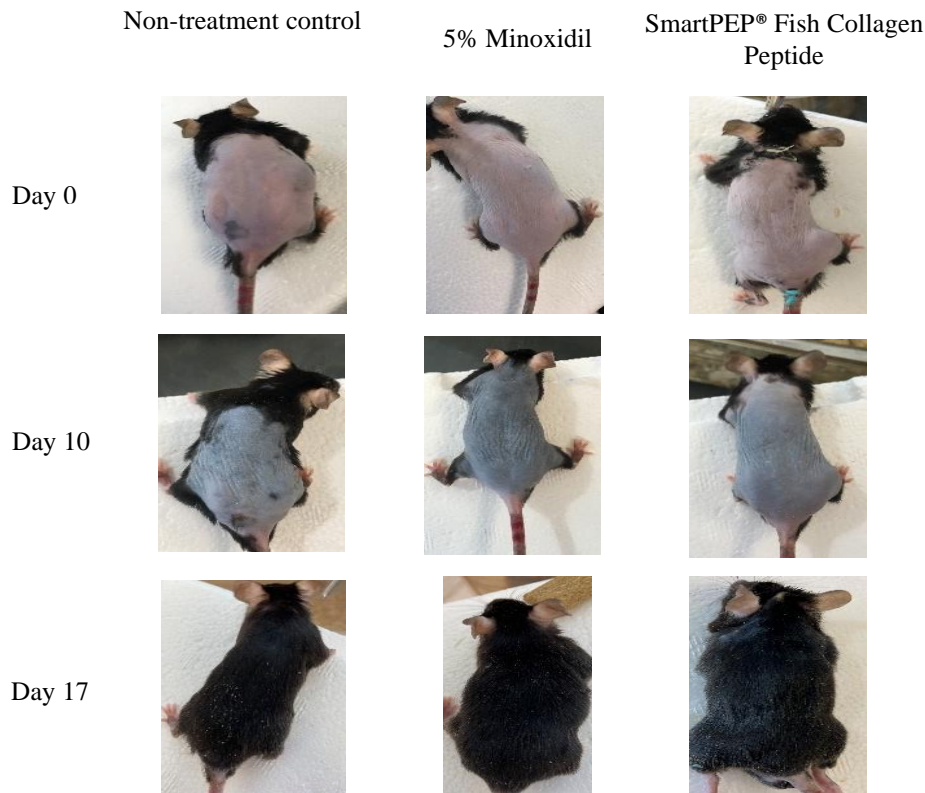
Measure: Bone density Scan

Osteoporosis is **a disease that weakens bones to the point where they break easily** - most often, bones in the hip, backbone (spine), and wrist. Without Collagen support the Calcium, it will deteriorate easily. They're closely related to the occurrence, development, and severity of osteoporosis. The Experiments have proven that the bone strength of aged Mice taking the SmartPEP® Collagen Peptide can be increased by 30%.

## Hair Growth Stimulation

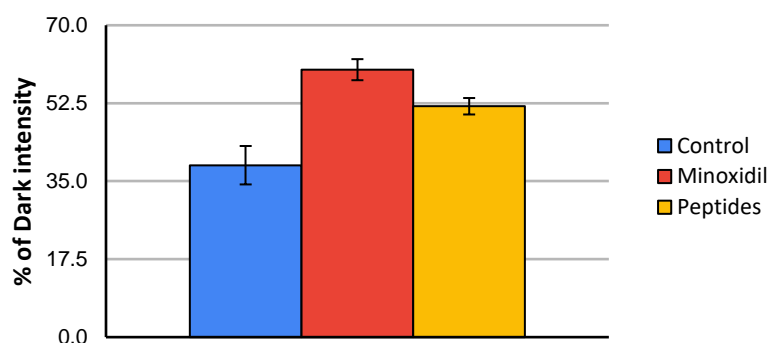
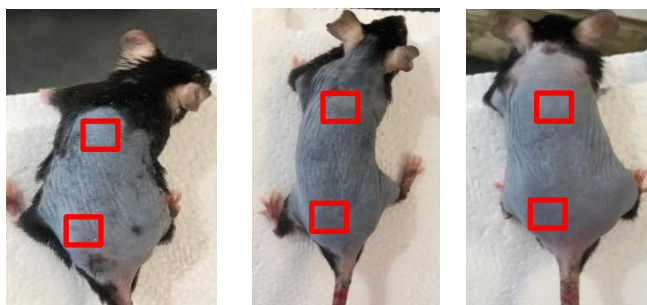
Animal study shows that supplementation with the specific bioactive SmartPEP® Fish Collagen Peptide can result in improved hair growth, by significantly increasing hair thickness. The study was conducted on 36 healthy mice, who each received an oral daily dose of SmartPEP® Fish Collagen Peptide (200 µl of 15% solution in PBS), Minoxidil (Rogaine, 5%) as positive control, or Non Treatment Control as placebo for 17 days. At Day 10 analysis, the intensity of black colour of each mouse was analyzed using ImagJ. The comparison of intensity of black colour of the three groups showed a statistically significant improvement in hair growth.

At the end of the supplementation period, the use of SmartPEP® Fish Collagen Peptide as well as Minoxidil led to a significant increase in hair thickness. The comparison of the three groups revealed a statistically significant increase in hair thickness in the SmartPEP® Fish Collagen Peptide group compared to placebo, confirming the benefits of SmartPEP® Fish Collagen Peptide to hair thickness, a key aspect of healthy hair appearance.



**Figure 1. Mice treated with SmartPEP® Fish Collagen Peptide showed a similar hair growth rate as Minoxidil.**  
Representative images of the effect of different treatments on hair growth in mice.

Non-treatment control      Minoxidil      SmartPEP® Fish Collagen Peptide



**Figure 2. Quantitation of the hair growth of mice on Day 10.**

The intensity of the black color on the dorsal side of the mice was analyzed by using ImageJ. Red squares indicate the measured area (upper images). A higher intensity of the black color indicates a greater effect on hair growth.

## Technical Specification

Test Items	Test Method	Tolerance Limits
Appearance	Organoleptic	Fine Powder, No agglomeration
Color	Organoleptic	White to off-white
Loss on drying (g/100 g)	Oven	≤ 7.0 %
Ash (g/100 g)	Oven	≤ 4.0 %
Total Nitrogen (g/100 g, dry basis)	Kjeldahl method	≥ 15%
Peptide (g/100 g, dry basis)	Kjeldahl method	≥ 87.0%
Hydroxyproline (g/100 g, dry basis)	HPLC	≥ 6.0%
The proportion of relative molecular weight ≤ 2000 Dal %	HPLC	≥ 80.0%

