SALUD Y BELLEZA DESDE EL INTERIOR

Alimentos funcionales, una tendencia creciente en América Latina

Fernando Blüguermann, Gerente Regional de Soporte Técnico y Aplicaciones para América Latina de Rousselot
Collagen peptides & Functional food

FoodTech Summit & Expo 2015. Fernando Blüguermann
Content of the Presentation

- Macro drivers
- Consumer drivers Food
- Consumer drivers Nutrition
Trends: Macro drivers I

- **WW population growth**
  - Need for more food / nutrition / pharma
  - Growth differs per region/country \(\rightarrow\) Different food trends per country

### POPULATION OF THE EARTH

Number of people living worldwide since 1700 in billions

- **2048**: 9 bln
- **2024**: 8 bln
- **1999**: 6 bln
- **2012**: 7 bln
- **1987**: 5 bln
- **1974**: 4 bln
- **1960**: 3 bln
- **1804**: 1 bln
- **1927**: 2 bln

**World population in 2050**

- **Africa** – 2.4 billion
- **Asia** – 5.2 billion
- **Europe** – 709 million
- **Latin America & Caribbean** – 782 million
- **North America** – 446 million

Source: United Nations, Department of Economic and Social Affairs, Population Division (2013)
Trends: Macro drivers II
Population aged 60 or over in 2014
Trends: Macro drivers II
Population aged 60 or over in 2050

- Need for more clinical products
- Need for healthy foods
Trends: Macro drivers III

- Growing welfare
- Need for specialty food
- Need for high quality food
- People consume more calories

Source: Economist Intelligence Unit
Economist.com/graphicsdetail

*At market exchange rates
Protein trend still going strong: New product introduction 2014 “high in protein” per market segment

- Cereals: mainly bars
- Dairy: mainly yoghurt and milk drinks
- Sports nutrition: mainly sports bars and sports powders
Protein trend still going strong: New product introduction 2014 “high in protein” per country

- Main market is US
- UK and Europe are also developing
- Trends come from the US to UK to the rest of the world. Be in time!
Protein rich foods: Recommended for all consumers

**The Elderly**
Aging is accompanied with an age-related muscle loss. The intake of adequate proteins is believed to avoid and/or slow down this process.

**Vegetarians**
As meat is one of the major sources of protein, vegetarians need to eat alternative sources of proteins to achieve their RDA.

**Dieters**
Proteins are known to increase satiety and can therefore prevent cravings and fight the obesity epidemic.

**Sportsmen**
Proteins are known to help with muscle synthesis and recovery.

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**Have you increased your protein intake over the past 2 years?**

<table>
<thead>
<tr>
<th>Country</th>
<th>Protein Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>24%</td>
</tr>
<tr>
<td>France</td>
<td>7%</td>
</tr>
<tr>
<td>Germany</td>
<td>10%</td>
</tr>
<tr>
<td>Russia</td>
<td>7%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>20%</td>
</tr>
<tr>
<td>USA</td>
<td>25%</td>
</tr>
</tbody>
</table>
Products with protein enrichment

The protein trend continuum

- Muscle building
- Muscle recovery
- Aging
- Vegetarian
- Weight management
- Curb cravings
- Satiety
- Breakfast Solution
- Bone health
- Toning
- Energy

Past

Present

Future?
Content of the Presentation

• Macro drivers

• Consumer drivers Food

• Consumer drivers Nutrition
Market trends, Nutraceuticals

- **Healthy Aging/Senior nutrition needs**
  - Aging populations, wish to maintain an active & healthy lifestyle
  - Joint & bone health - key concerns

- Move from traditional supplements towards beverages and foods

- **Clean label, natural, GRAS**
- Increased importance of health claims

- **Sports nutrition moving mainstream, protein is ‘hot’**

- ‘**Beauty from within**’ a mature market in Japan, but still growing in all other regions

Sources: Innova market insights and Euromonitor
Health and Wellness market growth per region according to Euromonitor.

Growth regions incl. China, parts of Asia Pacific, Europe and Americas.
Asia- Key opportunity in markets today: 65+ yrs: The ‘wealthy, healthy and ready to spend’
Content of the Presentation

Mobility
People want to stay healthy & active as they age...
The concept of ‘preventative nutrition’ is gaining popularity

**Health insurance costs are increasing**
- Government Health insurance schemes are under pressure due to aging populations and rising costs, - move towards more private insurance
- Authorities encourage their populations to eat healthy in order to prevent diseases “An ounce of prevention is worth a pound of cure”
- The most costly diseases today in the western world are cardiovascular diseases, cancer, arthritis and osteoporosis

**Nutritional manufacturers** can benefit from:
- Prevention policies to promote healthy products
- General trend in population for self-care, healthy living and wellness

⚠️ Develop new markets with new products adapted to aging consumers nutritional needs
Concern for health is high amongst seniors and they are prepared to make food choices to look after themselves.

Typical infirmities of old age

<table>
<thead>
<tr>
<th>Condition</th>
<th>Concerned</th>
<th>Affected</th>
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</thead>
<tbody>
<tr>
<td>Eye health</td>
<td>40%</td>
<td>24%</td>
</tr>
<tr>
<td>Bone health</td>
<td>35%</td>
<td>10%</td>
</tr>
<tr>
<td>Joint health</td>
<td>38%</td>
<td>10%</td>
</tr>
<tr>
<td>Lack of mental sharpness or focus</td>
<td>38%</td>
<td>6%</td>
</tr>
</tbody>
</table>

38% Of seniors make food choices for healthy aging
Key ageing concerns

People feel the impact of ageing....
When 60+ years, the statistics show:

- 20% of all women and 10% of all men suffer from **Arthritis**
  - causing joint pain and joint problems

- 30% of all postmenopausal women develop **Osteoporosis**
  - leading to bone fractures

- 30% are affected by **Sarcopenia**
  - the loss of muscle mass and strength

**Loss of mobility & musculoskeletal health**

**Loss of youthful appearance – skin ageing**
The effect of ageing on collagen in skin and on bones

From the age of 30 ... less collagen is produced by the body

Skin collagen (µg collagen/mg protein) and bone mineral density (g hydroxyapatite/cm²) related to age. Figure adapted from: Castelo-Branco C. et al., Maturitas (1994) 18:199-206.
From Dietary supplements to Functional foods & beverage

According to Frost Sullivan (2010):

- European market:
  - Dietary supplements dominate

Key trends:

- Shift towards new innovative delivery mechanisms

- **Functional food and beverages** segment growing at higher rate than **Dietary supplements**

So where are we today?
Product launches with functional claims is on the rise

Figure 8: Number of New Product Launches Globally with Functional Claims, 2008-2013

Source: Mintel, Global New Product Database (GNPD)
“High growth in global new functional food & beverage products with a protein claim”

Number of global product launches of food & beverages with a protein claim
Index: 2009=100%

- **Global**
  - 2009: 100.0%
  - 2010: 117.8%
  - 2011: 115.7%
  - 2012: 188.0%
  - 2013: 207.3%

- **United States**
  - 2009: 100.0%
  - 2010: 119.8%
  - 2011: 126.9%
  - 2012: 204.1%
  - 2013: 204.1%

Innova market insights, 2014
Greek yogurt became the first truly mainstream protein product

Innova market insights, 2014
Innova Market Insights
Global Product launches with collagen as active ingredient

Global Product Launches Tracked with Collagen as Ingredient Jan 2010~Dec 2014

Source: Innova database, 2015 ‘New product launches tracked’. Note the database include a representative snapshot of the market only.
Innova market insights, Jan 2015
The biggest and fastest growing categories for collagen
Market for preventive nutrition foods

Markets of preventive nutrition are wellness foods and clinical nutrition. These markets are merging closer together.

- **Wellness/Healthy Living**
  - Margins: 😊😊

- **Medical/Clinical Foods**
  - Margins: 😊😊😊

Sources: Innova market insights 2013
Change in protein product positioning and delivery formats

From Sports nutrition...

...to Mainstream Nutrition

Innova market insights, 2014
Global Collagen peptides market

• The market for collagen peptides is projected to grow at a **CAGR of 7.1%** to exceed **$800 million** by **2019**
• North America estimated as the biggest market today
• Growth driven by the **advancement of functional and processed food & beverage industry**

Latin America Collagen peptides market

Food & Drinks growing at 40%

Source: Innova/Rousselot
Trending now in US and around the world: Bone Broth

- Bone broth contains collagen, chondroitin, glucosamine, GAGs etc and is currently popular among consumers for several health benefits
  - Skin
  - Joints
  - Bones

- A healthy alternative to e.g. coffee
- Many celebrity endorsements, e.g. from actors, sports people

**Tip:** Peptan is collagen type 1, same as found in bones. Peptan taken as a supplement is an excellent alternative to bone broth as it offers the same health benefits.

**Brodo:** bone broth takeaway in New York. Price ranges from $4.5 to $9 a cup.

Source: Nutraingredients
Product delivery formats for collagen are evolving

**ASIAN focus**

**Today:** - powder formulations, -shots, - jellies/gummies dominate with functional beverages and dairy products on the rise

- Skin Beauty
  - Cosmetic brands crossover into Nutricosmetics (Kanebo, Shiseido, etc)
  - Collagen plus other active beauty ingredients: Vitamin C, HA, placenta

- **Healthy aging** (Joint, Bone, connective tissue)
  - Collagen plus actives such as Glucosamine, Chondroitin, Calcium..
Product delivery formats for collagen are evolving

ASIAN focus
Dairy is an ideal delivery format for seniors (Calcium+protein)

Products claim is simply ‘Collagen’ – benefits recognised by consumers

Thai-Danish
Pineapple Flavored
UHT Drinking
Yogurt With 0.3% Collagen
(Thailand, Nov 2014)

Kagome Bifidus & Collagen Yogurt Drink
(Japan, Aug 2014)

Lan Ding Shu Collagen Milk
(China, Mar 2014)

Vinamilk ProBeauty Aloe Vera Yogurt
(Vietnam, Feb 2014)
Description: Four individual pots of aloe vera flavored yogurt with collagen and vitamin C.

Lactasoy Soymilk Light Plus Collagen
(Thailand, Jan 2014)
Description: Six SIG combiblocs of UHT soymilk plus collagen,
Product delivery formats for collagen are evolving

**Western markets (NAM, Europe) Today:**
- tablets/capsules, powder formulations,
- drinks/shots,
- nutritional bars

**Marketed mainly as ‘collagen’ or component of protein blends**
- Skin, hair, nails – Beauty supplements
- Joint health - supplements w. collagen plus other active ingredients
- Healthy aging mainly seen in crossover to Sports/Fitness nutrition

muscle maintenace and wellness focus
Product delivery formats for collagen are evolving

Latin America
- tablets/capsules, powder formulations, - drinks/shots, Cereal/nutritional bars

Marketed mainly as ‘collagen’, as component of protein blends or in combination with fruits/superfruits

- Skin, hair, nails – Beauty supplements
- Joint health - supplements w. collagen plus other active ingredients
- Healthy aging mainly seen in crossover to to Sports/Fitness nutrition muscle maintenace and wellness focus
Content of the Presentation

Beauty Skin
Following the Asian Health & Beauty approach

Japan:
Shiseido The Collagen Drink
Three bottles of low molecular fish collagen drink with eucommia ulmoides tea, ginseng, pearl-barley, GABA, ornithine, hyaluronic acid, ceramide, royal jelly, vitamin C.

Most popular sales channel
Convenience stores; Lawson, FamilyMart, 7-Eleven
## Ingredient awareness amongst UK Consumers!

### Ingredients awareness: significant correlations

<table>
<thead>
<tr>
<th></th>
<th>Omega 3</th>
<th>Lactobacillus Casei</th>
<th>Collagen</th>
<th>Vit C</th>
<th>Vit D</th>
<th>Calcium</th>
<th>Ginseng</th>
<th>Green Tea</th>
<th>Inulin</th>
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<tbody>
<tr>
<td>Heart health</td>
<td>41%</td>
<td>1%</td>
<td>3%</td>
<td>13%</td>
<td>8%</td>
<td>7%</td>
<td>6%</td>
<td>14%</td>
<td>2%</td>
</tr>
<tr>
<td>Beauty Benefits</td>
<td>7%</td>
<td>1%</td>
<td>70%</td>
<td>16%</td>
<td>16%</td>
<td>8%</td>
<td>5%</td>
<td>9%</td>
<td>1%</td>
</tr>
<tr>
<td>Brain &amp; Nervous System</td>
<td>35%</td>
<td>1%</td>
<td>3%</td>
<td>18%</td>
<td>22%</td>
<td>12%</td>
<td>20%</td>
<td>11%</td>
<td>2%</td>
</tr>
<tr>
<td>Gut Health</td>
<td>6%</td>
<td>68%</td>
<td>1%</td>
<td>6%</td>
<td>5%</td>
<td>3%</td>
<td>6%</td>
<td>19%</td>
<td>8%</td>
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<tr>
<td>Weight Management</td>
<td>3%</td>
<td>4%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>3%</td>
<td>4%</td>
<td>16%</td>
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<tr>
<td>Energy</td>
<td>4%</td>
<td>3%</td>
<td>1%</td>
<td>24%</td>
<td>14%</td>
<td>5%</td>
<td>27%</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
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<td>5%</td>
<td>22%</td>
<td>25%</td>
<td>60%</td>
<td>5%</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>1%</td>
<td>21%</td>
<td>14%</td>
<td>0%</td>
<td>9%</td>
<td>3%</td>
<td>26%</td>
<td>15%</td>
<td>75%</td>
</tr>
</tbody>
</table>

Source: Survey, SenseReach, UK, +1500 consumers, 70 pct female
Market Examples – ‘Beauty from within’ success

- **Pure Gold Collagen**, Minerva labs, UK (www.gold-collagen.com)
- Sold online and in Boots
- Key active ingredient is collagen (Peptan) + vitamins
- Customer review on Boots website: 4.3 out of 5 stars (52 reviews) (85% would recommend the product)
- Approx 50 EUR (10 * 50 ml) for 10 day

**SKINCARE STARTS WITH A SIP...**

- Make Pure GOLD COLLAGEN® part of your beauty regime
- Promote younger looking skin
- Improve skin hydration
- Improve skin elasticity and suppleness
- Reduce the formation of deep wrinkles
- Promote healthy hair and nails
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<th>(source-www)</th>
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<td>Company</td>
<td>SAPANAN</td>
<td>SINNIPPAI YAKUHIN</td>
<td>SkinGain _Med-eq</td>
</tr>
<tr>
<td>Country</td>
<td>Thailand</td>
<td>Japan</td>
<td>Norway</td>
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<td>Event Month</td>
<td>07/2012</td>
<td>07/2012</td>
<td>2012</td>
</tr>
<tr>
<td>Product Brand</td>
<td>St. Anna Collagen Drink</td>
<td>Sinnippai Collagen Jelly Peach Aji: Stick Shaped Collagen Jelly with Peach Flavor</td>
<td>SkinGain</td>
</tr>
<tr>
<td>Product Description</td>
<td>Collagen drink in a plastic bottle.</td>
<td>Seven stick shaped collagen jellies with peach flavor, in a plastic pouch.</td>
<td>SkinGain is a flavoured powder supplement product.</td>
</tr>
<tr>
<td>Claims Features</td>
<td>Certified halal. Collagen 2,000mg. Dietary supplement product. Certified halal.</td>
<td>Good for one week. Contains 15400mg fish collagen peptide, 105mg N-acetylglucosamine, 52.5mg chondroitin, 10.5mg hyaluronic acid and 25.2mg royal jelly extract.</td>
<td>counteract the skin's aging process. SkinGain contains Peptan combined with other fish collagen. Each sachet contains 5000 mg of Peptan collagen.</td>
</tr>
<tr>
<td>View Details</td>
<td>view details</td>
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</tr>
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Source: Innova database 2012
## Latest Collagen product launches from the market place

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<tbody>
<tr>
<td>Company</td>
<td>KIM HENG</td>
<td>ULTRA PRIMA ARTABOGA</td>
<td>NATURES BOUNTY</td>
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<td>Country</td>
<td>Thailand</td>
<td>Indonesia</td>
<td>Brazil</td>
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<td>Event Month</td>
<td>05/2012</td>
<td>07/2012</td>
<td>06/2012</td>
</tr>
<tr>
<td>Product Brand</td>
<td>Jelly <strong>Beautie Collagen Juice Drink with Mixed Fruit Flavor</strong></td>
<td>OT Vitacharm <strong>Collagen Multi Probiotic Drink</strong></td>
<td>Natures Bounty Collagen Dietary Supplement 90 Tablets</td>
</tr>
<tr>
<td>Product Description</td>
<td>Juice drink with mixed fruit flavor, in a doy pouch.</td>
<td>Five individual bottles of collagen probiotic drink in a cardboard box.</td>
<td>Hydrolyzed collagen with <strong>Vitamin C</strong>. Collagen is a complex protein for the growth, repair and maintenance of <em>skin, hair, nail</em> and <em>bones.</em></td>
</tr>
<tr>
<td>Claims Features</td>
<td>Contains 60 calories. With 700mg collagen. Plus vitamin C.</td>
<td>Contains 1,000mg collagen. Multi-probiotic ABC. Sugar free. With Lactobacillus Acidophilus, Bifidobacterium, Lactobacillus Casei. Single shot. Ready-to-drink.</td>
<td><strong>Supports skin, hair and health. Beauty starts on the inside.</strong> No artificial color, flavor or sweeter. No preservatives.</td>
</tr>
<tr>
<td>View Details</td>
<td><a href="#">view details</a></td>
<td><a href="#">view details</a></td>
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</tbody>
</table>
# Latest Collagen product launches from the market place

<table>
<thead>
<tr>
<th>Id</th>
<th>Company</th>
<th>Country</th>
<th>Event Month</th>
<th>Product Brand</th>
<th>Product Description</th>
<th>Claims Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1237998</td>
<td>MEIJI</td>
<td>Thailand</td>
<td>05/2012</td>
<td>Meiji Yoghurt Beauti Brightt: <strong>Yogurt with Crystal Collagen Beads</strong></td>
<td>Four cups of low fat yogurt with 0.8% crystal collagen beads, held in a plastic wrapper.</td>
<td>Low fat. High in calcium. Lower in sugar. High in fiber. Contains collagen <strong>1120mg</strong>. Certified halal. HACCP certified.</td>
</tr>
<tr>
<td>1247709</td>
<td>KANRO</td>
<td>Japan</td>
<td>05/2012</td>
<td>Kanro Pure Gummy Himitsu No Koi Aji: <strong>Gummy</strong></td>
<td>Gummies with olive flavor, in a resealable plastic pouch.</td>
<td>Secret taste of love. Contains extract of love. Limited edition. <strong>Contains vitamin C and collagen</strong>.</td>
</tr>
</tbody>
</table>

**View Details**
- [view details](#)
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<table>
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<tr>
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<td>Company</td>
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<td>Country</td>
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<td>Event Month</td>
<td>02/2012</td>
<td>05/2012</td>
<td>12/2011</td>
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<tr>
<td>Product Brand</td>
<td>Blink Collagen Drink</td>
<td>Blink Collagen &amp; Co Q10 Drink</td>
<td>Samyang BDlab Beauty Aid Soft Drink</td>
</tr>
<tr>
<td>Product Description</td>
<td>Six glass bottles of collagen drink in a cardboard box.</td>
<td>Six bottles of collagen and Co Q10 drink in a cardboard box.</td>
<td>Soft drink with hyaluronic acid and collagen, for beauty aid.</td>
</tr>
<tr>
<td>View Details</td>
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<tbody>
<tr>
<td>1297414</td>
<td>MEIJI</td>
<td>Japan</td>
<td>Aug 2012</td>
<td>Meiji Shokkans Gummi Gunittu Cola Aji: Hard Gummies with Cola Flavor</td>
<td>Hard gummies with cola flavor, in a resealable plastic pouch.</td>
<td>Contains <strong>2800mg collagen.</strong></td>
<td>view details</td>
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<tr>
<td>1323096</td>
<td>TROPICAL OASIS</td>
<td>United States</td>
<td>Oct 2012</td>
<td>Tropical Oasis Sleep-A-Weigh Plus Dietary Supplement</td>
<td>Tropical Oasis Sleep-A-Weigh helps your body rebuild muscle, increase metabolism, and <strong>fight aging</strong>, all while you sleep! Collagen is a <strong>structural protein</strong> that forms your body's connective tissues including tendons, ligaments, muscle, and cartilage, which your body repairs and rebuilds while you sleep. It is also a nutrient that helps give additional thickness and strength to your <strong>skin, hair, and nails.</strong></td>
<td>With vitamin C, vitamin B12, and collagen. Certified halal.</td>
<td>view details</td>
</tr>
<tr>
<td>1321057</td>
<td>DK HEALTH</td>
<td>Thailand</td>
<td>Oct 2012</td>
<td>NatureGift Instant <strong>Coffee Powder</strong> with Collagen, Vitamin &amp; Minerals</td>
<td>Five sachets of instant coffee powder with collagen, vitamin, and minerals.</td>
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<td>Aug 2012</td>
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<tr>
<td>Product Brand</td>
<td>Binh An Cherry <strong>Flavored Collagen Drink</strong></td>
<td>Kracie Funwarika <strong>Gum Beauty</strong> Rose Aji: Rose Gum</td>
<td>Meiji Kaju Gummy Zakuro: Pomegranate Flavored <strong>Gummies with Collagen</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product Description</td>
<td>Cherry flavored <strong>collagen drink</strong> in an easy-to-open aluminum can.</td>
<td>Six pellets of rose gum with Damask rose oil, <strong>collagen</strong>, and hyaluronic acid.</td>
<td>Pomegranate flavored <strong>gummies with collagen</strong>, in a 81g foil bag.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Claims Features</td>
<td>Packed with special nutritional supplements such as <strong>collagen</strong>, vitamin C, taurine, and essential amino acids. Proven to help <strong>rejuvenate skin</strong> and healthier hair. Ready-to-drink.</td>
<td>Freshens your breath with a scent of rose.</td>
<td>Contains <strong>6000mg collagen and collagen peptide. 100% Pomegranate juice (Straight conversion)</strong>. No colorings.</td>
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What’s next?

‘Beauty from within’ growth in Europe, N. America, S. America markets based upon:

- Recognised and trusted functional ingredients
- Natural, clean label products
- Multiple benefits, offered by combination foods and supplements
  - Food and pharma merging
  - Preventative approach
  - Improving health and looks
- Evidence for efficacy – Clinical trials and documentation

Innovation
- New product formats and new ingredients!
Content of the Presentation

Backup Science
Peptan® benefits are proven in 3 clinical skin studies

Placebo controlled Clinical studies carried out in Japan and France confirm the anti aging effect of taking Peptan®

Successfully tested by leading skin research centers
- SOUKEN institute in Tokyo
- DERMSCAN institute in Lyon
- COSDERMA laboratories in Bordeaux
- >150 women participated
- Placebo controlled studies
- Latest advanced skin analysis

Scientifically proven Anti-age benefits - in just one month!
Peptan® increases skin hydration

Peptan® increases skin hydration by **28% after 8 weeks**

The skin hydration level of **91%** of Peptan® group volunteers increased after 8 weeks

Study YNTKK – 2008 - 4144
The number of deep wrinkles significantly increases with the placebo between baseline and 12 weeks: +30%
Peptan® improves skin structure, - reversing the effect of aging!

Collagen fragmentation decreases significantly in the deep layers of the skin with Peptan: - 31%. Significant effect after just 1 month.

Collagen fragmentation (relative change) assessed by confocal laser after intake of Peptan® F at week 0, 4 and 12.

Study Cosderma 2012, in press
Peptan® increases collagen density - boosting skin from the inside

Collagen density was significantly increased after just 1 month with Peptan: + 9 %

** Study Cosderma 2012, in press

** p < 0.001
Collagen peptides restore Bone Mineral Density to a normal level

**Peptan® in vivo studies** (Guillerminet et al. 2010)

Ovariectomized mice were used to simulate low bone mass density: osteopenia

The measurements show restoration of the bone mineral density value close to the level of the control group (which was not ovariectomized).

Bone Mineral Density (BMD) of the mice in the control group (Control), the ovariectomized group fed no Peptan (Ovx), and the ovariectomized group supplemented with Peptan (Ovx + Peptan) after 12 weeks. Groups with different letters indicate significant difference (p<0.05).
Collagen peptides increase bone solidity and strength

Peptan® *in vivo* studies (Guillerminet *et al.* 2010)

Due to restoration of the bone size, the strength to apply to break the bone is higher.

*Measure of the cortical area and the ultimate strength, in the control group (Control); the ovariectomized group fed without Peptan™ (Ovx), and the ovariectomized group fed with Peptan™ (Ovx + Peptan). Groups with different letters indicate significant difference (p<0.05) - ab is not significantly different from a or b.*
Research publications - Bone Health

Research studies conducted at INRA-AgroParisTech laboratory (France) confirm Peptan® benefits on bone health

1st publication in the peer-reviewed journal of the International Bone and Mineral Society “Bone”

2nd publication in the peer-reviewed journal “Osteoporosis International”

Hydrolyzed collagen improves bone metabolism and biomechanical parameters in ovariectomized mice: An in vitro and in vivo study

Fanny Guillerminet a,b,d, Hélène Beaupied c, Véronique Fabien-Soulé d, Daniel Tomé a,b, Claude-Laurent Benhamou c, Christian Roux e, Anne Blais a,b,*

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b Inserm U658, Orleans Regional Hospital and University of Orleans, Orleans 45000, France
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d Université Paris Descartes, Département de Rhumatologie, APHP, Hôpital Cochin, Paris, France

Original Article

Hydrolyzed collagen improves bone status and prevents bone loss in ovariectomized C3H/HeN mice

F. Guillerminet • V. Fabien-Soula • P. C. Even • D. Tomé • C.-L. Benhamou • C. Roux • A. Blais
Prevention of Osteopenia

- A **healthy lifestyle and exercise** is important to prevent osteopenia and its later stage osteoporosis

- It’s scientifically proven that **protein is required** for calcium absorption

- Intake of 10g/day of **Collagen Peptides can increase bone mineral density**

- **Peptan® is scientifically proven** to support bone health in *in-vitro* and *in-vivo* studies:
  - Stimulates osteoblasts and bone health markers
  - Increase bone strength and bone mineral density

An appropriate **mix of Calcium, vitamin D and collagen peptides** is recommended to maintain good bone health
Proven effectiveness on knee Joints-
Clinical study 2013

Peptan® Clinical study, double blind, placebo controlled

• 100 participants, oral intake, powder drink.
Peptan 8 g/day or placebo (maltodextrin) 8 g/day

• Inclusion criteria:
- Complained of knee joint pain or joint discomfort
- X-ray for diagnostic, classification: 0-III level
- 40 to 70 years

• 6 months period. Joint health assessed at time 0, 3 and 6 months

• WOMAC: standard assessment/questionnaire, measures 5 items for pain (score range 0–20), 2 for stiffness (score range 0–8), 17 for functional limitation (score range 0–68)

Lysholm: knee scoring method for joint movement, higher score = better knee function. Supplements WOMAC
Peptan® reduces joint pain and improves joint function

After just 3 months of Peptan® intake, the patients reported significant improvements.

Reduced joint pain - improved joint flexibility and better overall joint functionality.

Development of WOMAC scores
(decreased score value = improvement)

Development of Lysholm scores
(increased score value = improvement)

WOMAC score for joint pain assessed at baseline and after 3 and 6 months of treatment. Improvement = lower score; Placebo n=49; Peptan® n=46; ns=non significant.

Lysholm score for joint function assessed at baseline and after 3 and 6 months of treatment. Improvement = higher score; Placebo n=49; Peptan® n=46; ns=non significant.

Results by Rousselot/Shanghai 6th people hospital (Jiang et al. 2014)