The Next Generation of Natural Proteins For Skin and Hair
In-Cosmetics Milan 2011
Proteins are the Building Blocks of Life

• Macromolecules constructed from one or more unbranched chains of amino acids → polymers
• A typical biological protein contains 200-300 amino acids
• A typical cosmetic protein contains 5-25 amino acids

Essential building blocks of skin & hair, proteins offer recognized protection and nutrition for a healthy, vibrant look.
The Role of Proteins in Skin

Proteins make up approximately 25% of the largest organ in the human body—the skin.

Three types of protein are found in the skin:

**Keratin** gives skin its strength and flexibility and waterproofs the skin surface.

**Elastin** helps to keep skin flexible but tight, providing a bounce-back reaction if skin is pulled.

**Collagen** is the cement that holds everything together, and provides structure and firmness to the body tissues including the skin.
The Role of Proteins in Skin

The skin is our first line of protection from the harsh effects of aging and the environment.

When its proteins are damaged by UV rays, free radicals, pollution, smoking and other factors, the structure becomes distorted, leading to poor skin texture, wrinkles and other imperfections.
The Role of Proteins in Hair

Proteins make up about 95% of human hair. Keratin is the main component.

Damage to the hair structure and reduction in the strength of the hair fiber are caused by daily stressors such as:

- Exposure to sunlight
- Daily grooming - shampooing, combing, brushing, blow drying, flat & curling irons
- Chemical treatments such as coloring & relaxing

These factors cause chemical degradation of lipids and proteins, as well as abrasion of the protein layers.
# Proteins in Personal Care

<table>
<thead>
<tr>
<th>Year</th>
<th>Volume, MM lbs</th>
<th>% Growth</th>
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<tbody>
<tr>
<td>2005 – 2006</td>
<td>2.6</td>
<td>4 %</td>
</tr>
<tr>
<td>2006 – 2007</td>
<td>2.7</td>
<td>4 %</td>
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<tr>
<td>2007 – 2008</td>
<td>2.8</td>
<td>4 %</td>
</tr>
<tr>
<td>2008 – 2009</td>
<td>2.9</td>
<td>2.5 %</td>
</tr>
<tr>
<td>2009 – 2010</td>
<td>3.3</td>
<td>16 %</td>
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</tbody>
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Source: Euromonitor
Products Containing Proteins in 2010

By Country / Number of Variants

>14,000 products

Source: Mintel
Products Containing Proteins in 2010

By Category / Number of Variants

>14,000 products

Source: Mintel
Products Containing Proteins in 2010

By Company / Number of Variants

Source: Mintel
BARLEY PROTEIN
Barley Protein

Made from food grade Golden Barley, gently hydrolyzed without enzymes, and excellent for men’s grooming products

- Sweet “whole grain” aroma
- Excellent pro-foamer
- Effective and natural skin soother & anti-irritant
- Minimizes roughness & chapping
- Good for men’s grooming products

INCI name: *Hydrolyzed Barley Protein*
Reduction of Irritation

In a MatTek EpiDerm test (in vitro on human derived epidermal keratinocytes), hydrolyzed barley protein significantly reduced the irritation potential of Sodium Dodecyl Sulfate (SDS).

When it was combined with SDS solution, at concentrations as low as 1%, there was a marked decrease in release of both IL-1α, a mediator of skin irritation and inflammation, and PGE₂, which is involved in the inflammatory pathway of the skin.
After Shave Study

• 9 male volunteers, with different degrees of facial hair and shaving habits

• Application after each shaving – total of 5 applications or 5 days

• Tested products on half face study
  – After shave gel with 2% Hydrolyzed Barley Protein
  – Placebo

• Participants evaluated the products on the following parameters:
  – Reduction in skin irritation
  – Improvement in skin moisture
  – Reduction in stinging
  – Reduction in skin itching
  – Post use skin smoothness
After Shave Effect

Rating system:
1 - No change
2 - Minimal improvement
3 - Moderate improvement
4 - Significant improvement
Facial Discomfort Relief

- 10% Lactic Acid
- 10 qualified subjects
  (with cumulative scores in the range 1.0 – 2.0)
QUINOA PROTEIN
Quinoa, (Chenopodium Quinoa Chenopodiaceae) is an ancient “grain”.

Cultivated in the South American Andes since at least 3,000 B.C., it has been a stable food source for millions of native inhabitants.

Considered a complete protein, Quinoa contains all 8 essential amino acids.

Not on the list of recognized allergens

Gluten free

INCI Name: Hydrolyzed Quinoa
Substantivity Test

- Cationic Rhodamine B dye (CI Basic Violet 10) used in the study reacts with active sites of sulphonic acid formed from the cleavage of cystine S-S (disulfide) bond during hair relaxation or chemical treatments
- Fluorescent complex formed on hair fibers can be detected under fluorescence microscope
- Higher intensities correspond to higher amounts of dye attached.
- Lower intensities correspond to higher substantivity of the active (link with damaged site of hair)

- Swatches of Caucasian hair – 5g/25cm, **double bleached**, pre-cleaned (w/10% solution of SLES)
- Treated with 1% solution of Quinoa Protein(1 & 5 applications); washed w/10% SLES solution between the treatments
- Control – hair swatches double bleached & pre-cleaned
- Analysis of hair surface and cross section (acrylic resin) – hair cortex
Substantivity Test Results

Hair surface

Control 1 treatment 5 treatments
Substantivity Test Results

Hair surface

Statistically significant difference for 1 & 5 applications in comparison to control
Substantivity Test Results

Hair Cortex (cross section)

Control  1 treatment  5 treatments
Substantivity Test Results

Hair Cortex (cross section)

After 5 treatments, a statistically significant improvement of 26% is seen
Substantivity Test Conclusion

Effect on hair surface

Quinoa Protein at 1% begins repairing the hair surface after just one treatment, showing a 16% reduction of fluorescence intensity.

After 5 treatments hair was further repaired, showing a 32% reduction of fluorescence intensity.

Effect on hair cortex (penetration)

Quinoa Protein at 1% results in revitalization and deep repair after 5 treatments, showing a 26% reduction of fluorescence intensity.
Quinoa Effect on Hair Combing

• Measurement of combing force was taken by a EMIC DL-500 modified to include the combing element

• Swatches of Natural Caucasian hair, 5g/25cm, were pre-cleaned with 10% SLES and treated with 1% solution of Quinoa Protein (1 & 5 applications)

Swatches were washed w/10% SLES solution between the treatments

• Control was pre-cleaned hair swatches of natural Caucasian hair

• Baseline measurements were taken and wet and dry hair were tested
Effect on Wet Combing

Statistically significant improvement in comparison to control and baseline values:
• 27% after 1 application
• 79% after 5 applications
Effect on Dry Combing

Statistically significant improvement in comparison to control and baseline values:
- 5% after 1 application
- 83% after 5 applications
Effect on Hair Gloss

• Glossmeter (BYK Gardner®)
• Measurement of specular reflection – represents the gloss of the surface
• Swatches of Dark Brown Caucasian Hair – 5g/25cm – pre-washed with 10% solution of SLES
• Treated w/1% solution of Quinoa Protein (1 & 5 applications); washed with 10% SLE between the treatments
• Control – pre-washed swatches and also baseline measurements
• Five consecutive readings were taken in different positions to obtain average gloss value for each swatch and each group

Diagram of specular reflection
Effect on Hair Gloss

Statistically significant improvement in comparison to control and baseline values:
• 26% after 1 application
• 51% after 5 applications
Styling Benefits for Ethnic & Curly Hair

After 2 applications of shampoo and conditioner (w/5% Quinoa Protein)

After 5 applications of shampoo and conditioner (w/5% Quinoa Protein)
Volume Enhancement with Quinoa Protein

After 2 applications of shampoo and conditioner (w/5% Quinoa Protein)
Quinoa Protein – Hair Care Application

Hair repair after chemical damage (hair bleaching, coloring, relaxing)

✓ Shampoos
✓ Rinse off Conditioners
✓ Leave-on treatments

Powerful hair protection & repair

Hair conditioning – ethnic and Caucasian hair

✓ Shampoos
✓ Conditioners

Good wet & dry combing, good detangling, high luster, smooth feel, good volume
Thank you!