

How Proteins Protect & Care

How Proteins Protect & Care

Benefits for Hair and Skin



How Proteins Protect & Care

Protein Differentiation

According to protein characteristics

- Origin
- Amino acid composition – depending on origin
- Degree of derivatisation
- Molecular weight



High Molecular

➡ **Ideal for skin care:** film forming, skin sensation, moisture, suppleness

Medium Molecular

➡ High substantivity on **skin and hair**, conditioning, gives body & volume to hair

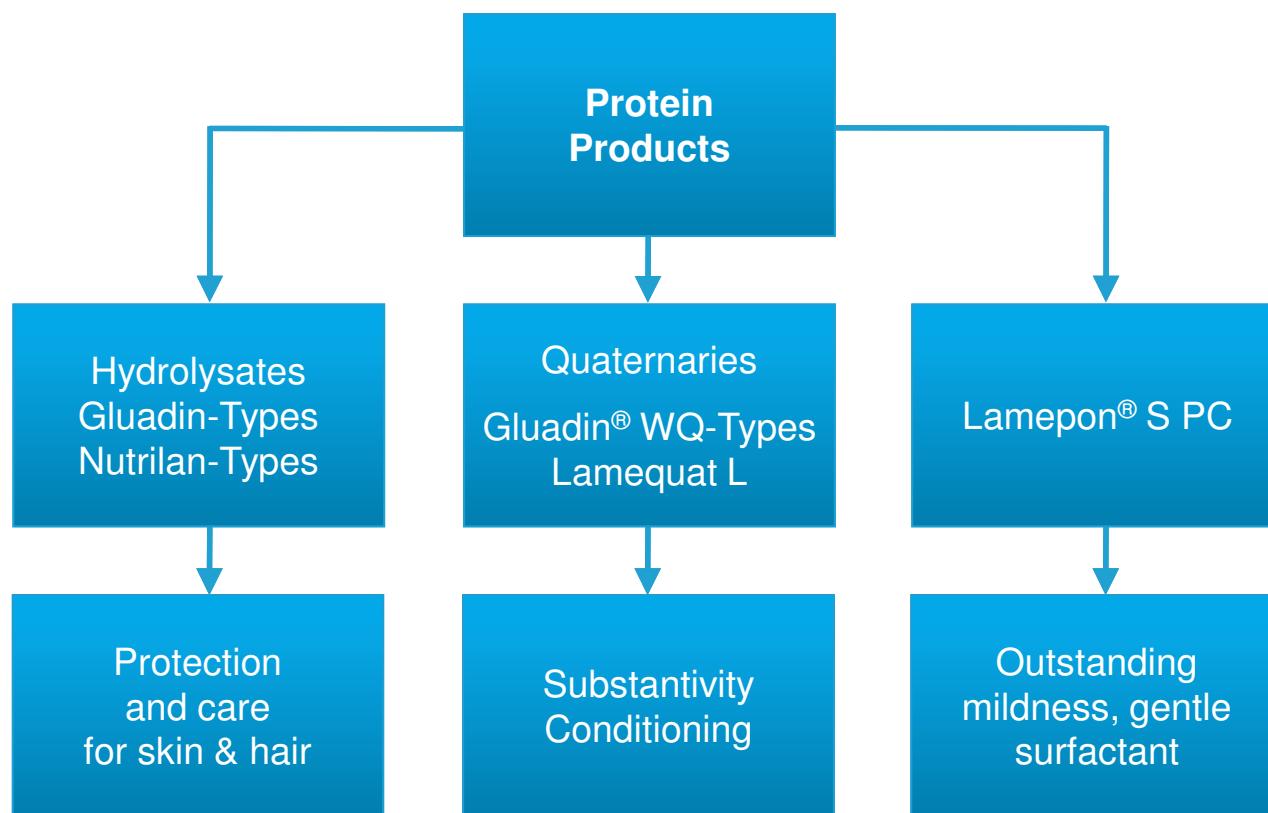
Low Molecular

➡ Ideal for **hair:** penetration, strengthening, repair, restructuring

How Proteins Protect & Care

Protein Differentiation

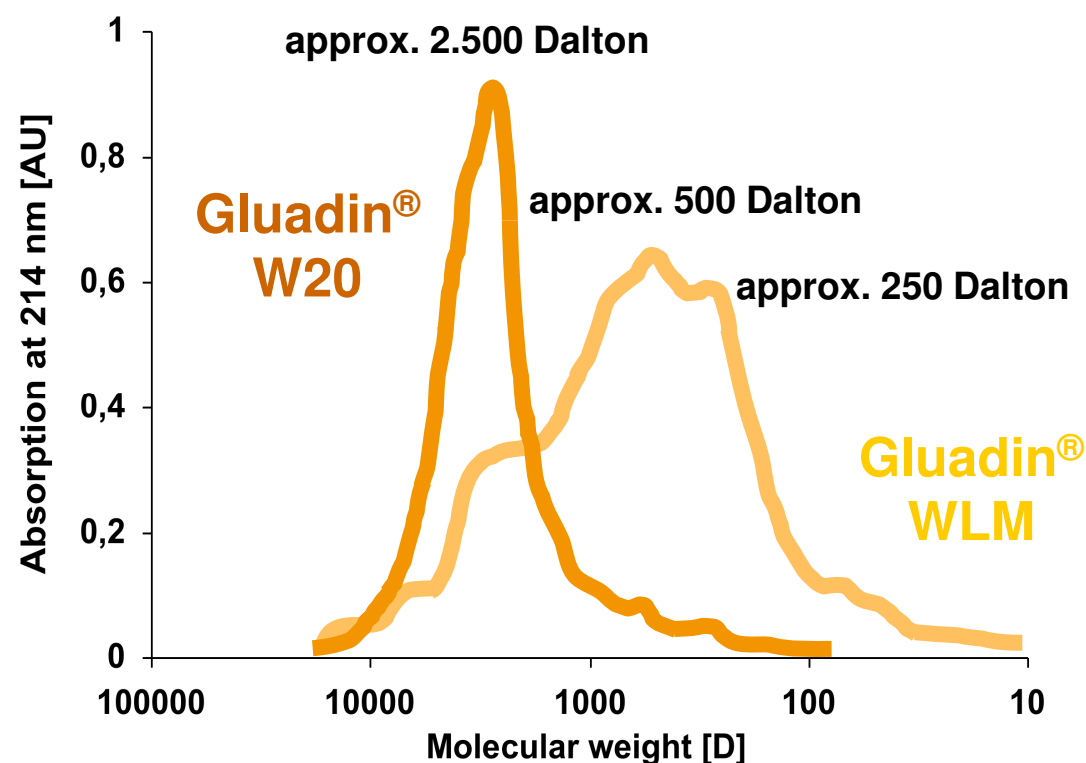
According to Derivatisation



How Proteins Protect & Care

Proteins – Differentiation in Molecular Weight

It can be expected that protein hydrolysates with a comparable molecular weight distribution show similar effects. Some examples will be demonstrated.



Proteins for Protection & Care



Plant derived protein products

Product name	INCI Name	Molecular weight/Dalton
Gluadin [®] AGP	Hydrolyzed Wheat Protein	high / < 80,000
Gluadin [®] Almond Benz	Hydrolyzed Sweet Almond Protein	medium / 3,000 – 5,000
Gluadin [®] R Benz	Hydrolyzed Rice Protein	medium / 2,000 – 3,000
Gluadin [®] Soy Benz	Hydrolyzed Soy Protein	medium – low / 2,500
Gluadin [®] W 40 BP	Hydrolyzed Wheat Protein (40% active matter)	medium / 2,500 – 5,000
Gluadin [®] WP	Hydrolyzed Wheat Protein (powder, unpreserved)	medium / 2,500 – 5,000
Gluadin [®] WLM Benz	Hydrolyzed Wheat Protein	low / < 1,000
Gluadin [®] WQ PP	Laurdimonium Hydroxypropyl Hydrolyzed Wheat Protein	medium / 3,000
Gluadin [®] WQTM P	Hydroxypropyltrimonium Hydrolyzed Wheat Protein	medium / 3,000

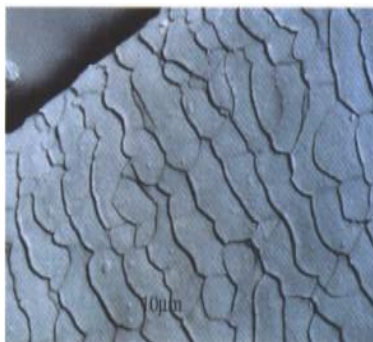
Protein products from other sources

Product name	INCI Name	Molecular weight/Dalton
Lamepon [®] S PC	Potassium Cocoyl Hydrolyzed Collagen	medium
Lamequat [®] L	Lauryldimonium Hydroxypropyl Hydrolyzed Collagen	medium
Nutrilan [®] I-50 BP	Hydrolyzed Collagen	medium / 5,000
Nutrilan [®] Keratin W PP	Hydrolyzed Keratin	medium / 3,000 – 5,000
Nutrilan [®] Milk	Hydrolyzed Milk Protein	medium / < 10,000

Abbreviations for new preservation systems without parabens:

Benz = Sodium Benzoate **BP** = Na-Benzoate + Phenoxyethanol **P**= Phenoxyethanol **PC** = Phenoxyethanol + Caprylylglycol **PP**= Phenoxyethanol + Potassium Sorbate

How Proteins Protect & Care



Proteins for Healthy Hair – Benefits & Claims

- Protection*
- Repair*
- Conditioning & Easy Combing*
- Volume Support*
- Strength & Resistance Increase*
- Fiber Reconstruction*
- Softness*
- Nice Touch*
- Vitality
- No Build-up Effect
- Ideal for Ethnic Hair

* For these claims efficacy proofs are available

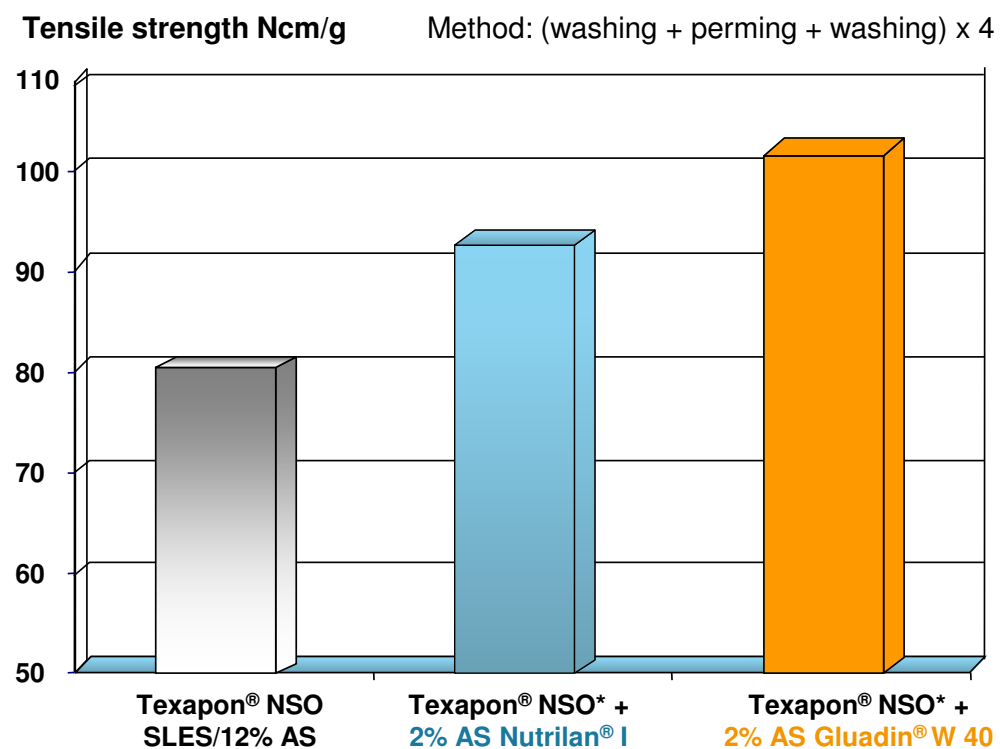
Internal

How Proteins Protect & Care



Tensile Strength Improvement

Determined at hair strands in wet condition



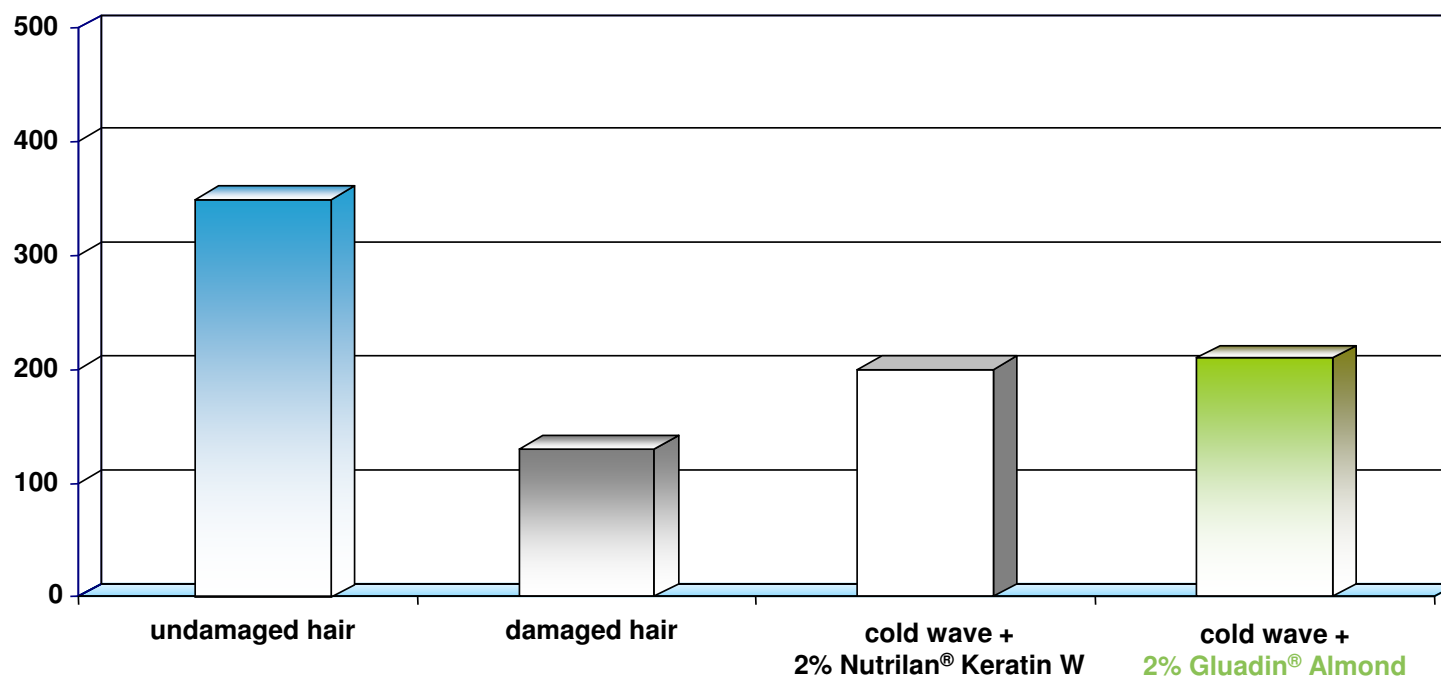
How Proteins Protect & Care



Breaking Strength of Individual Wet Hair Fibres

Determined by tear strength measurement

Tear Strength mN Treatment: perm with 7 % thioglycolic acid, pH 9.0 1 h



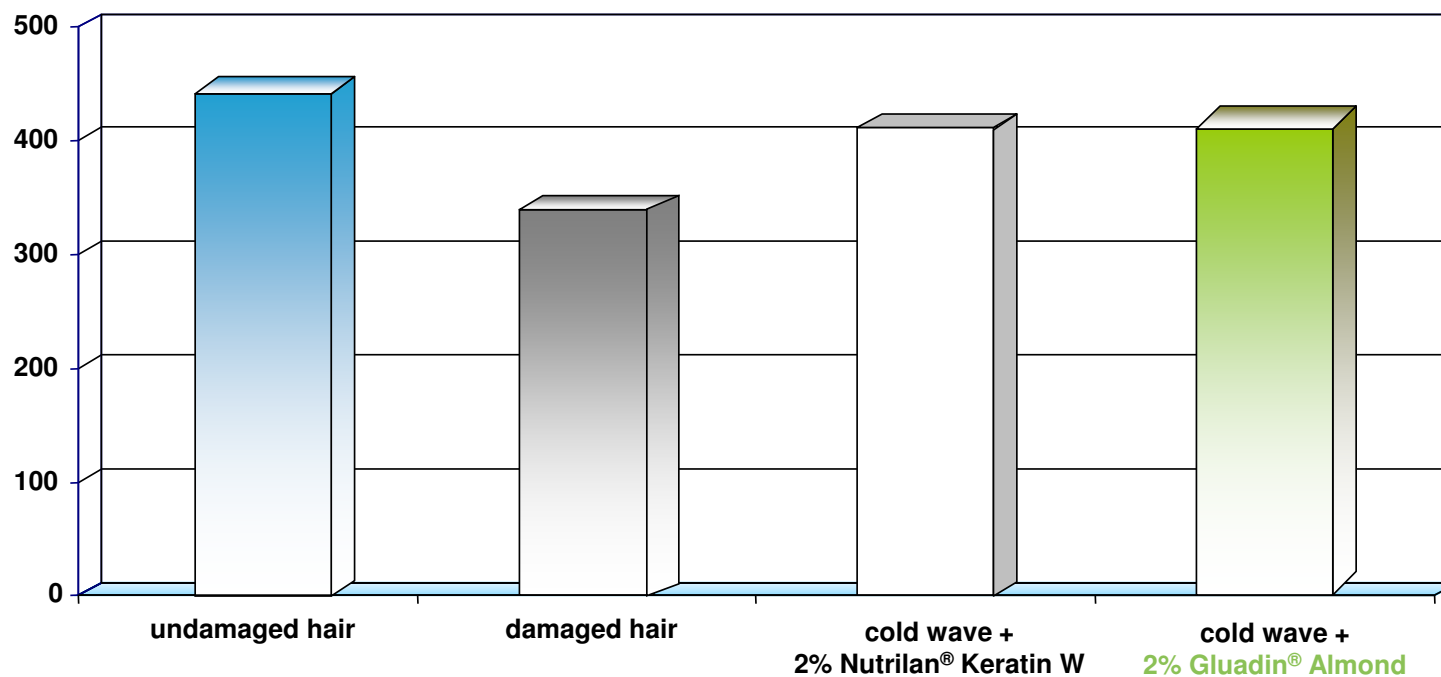
How Proteins Protect & Care



Breaking Strength of Individual Dry Hair Fibres

Determined by tear strength measurment

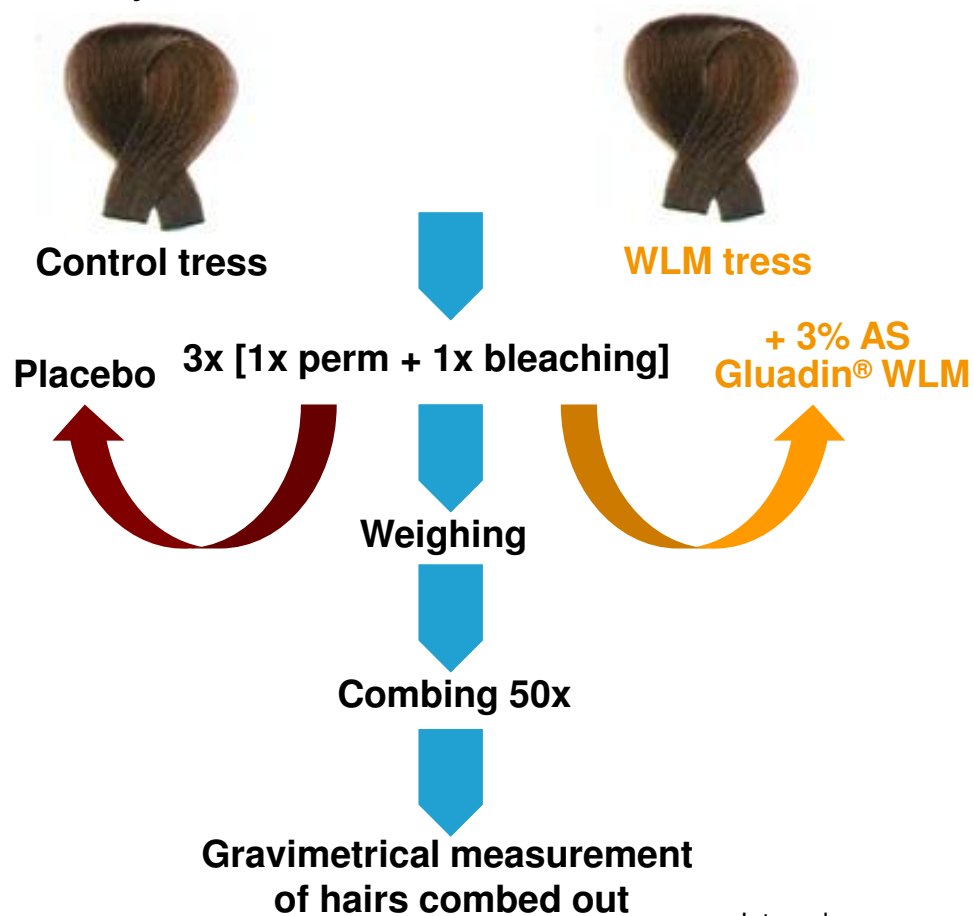
Tear Strength mN Treatment: perm with 7 % thioglycolic acid, pH 9.0 1 h



How Proteins Protect & Care

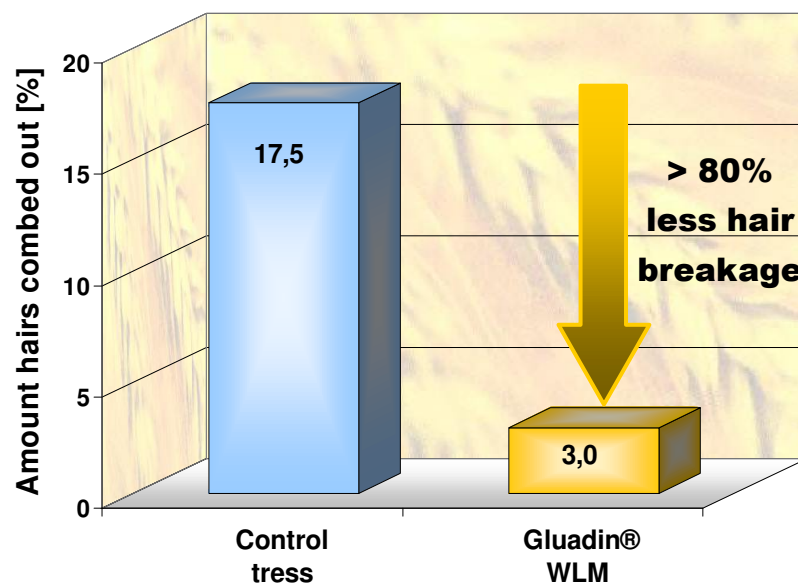
Protection – Anti-Hair Breakage Efficacy

Determined by the comb-out level



How Proteins Protect & Care

Anti-Hair Breakage Efficacy



- Reduction of hair breakage by more than 80%
- Structuring of hair fibers leading to mechanical resistance
- Protection against daily physical or chemical stresses



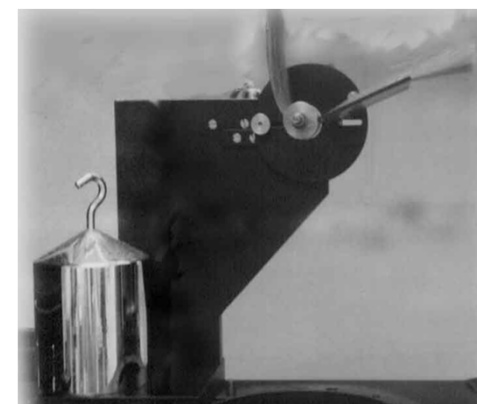
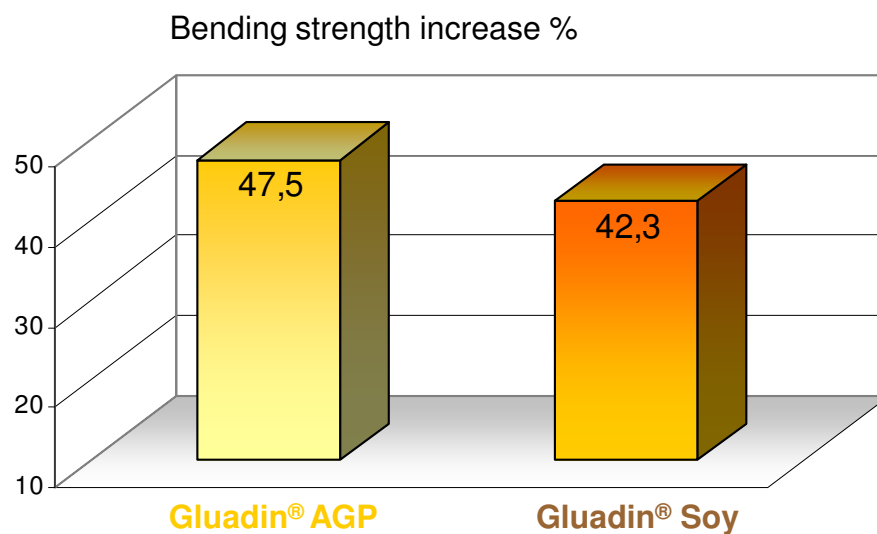
How Proteins Protect & Care



Bending Strength Improvement

Volume and Styling Support

Rinse-off treatment with hair tresses
with 0.5% AS after bleaching



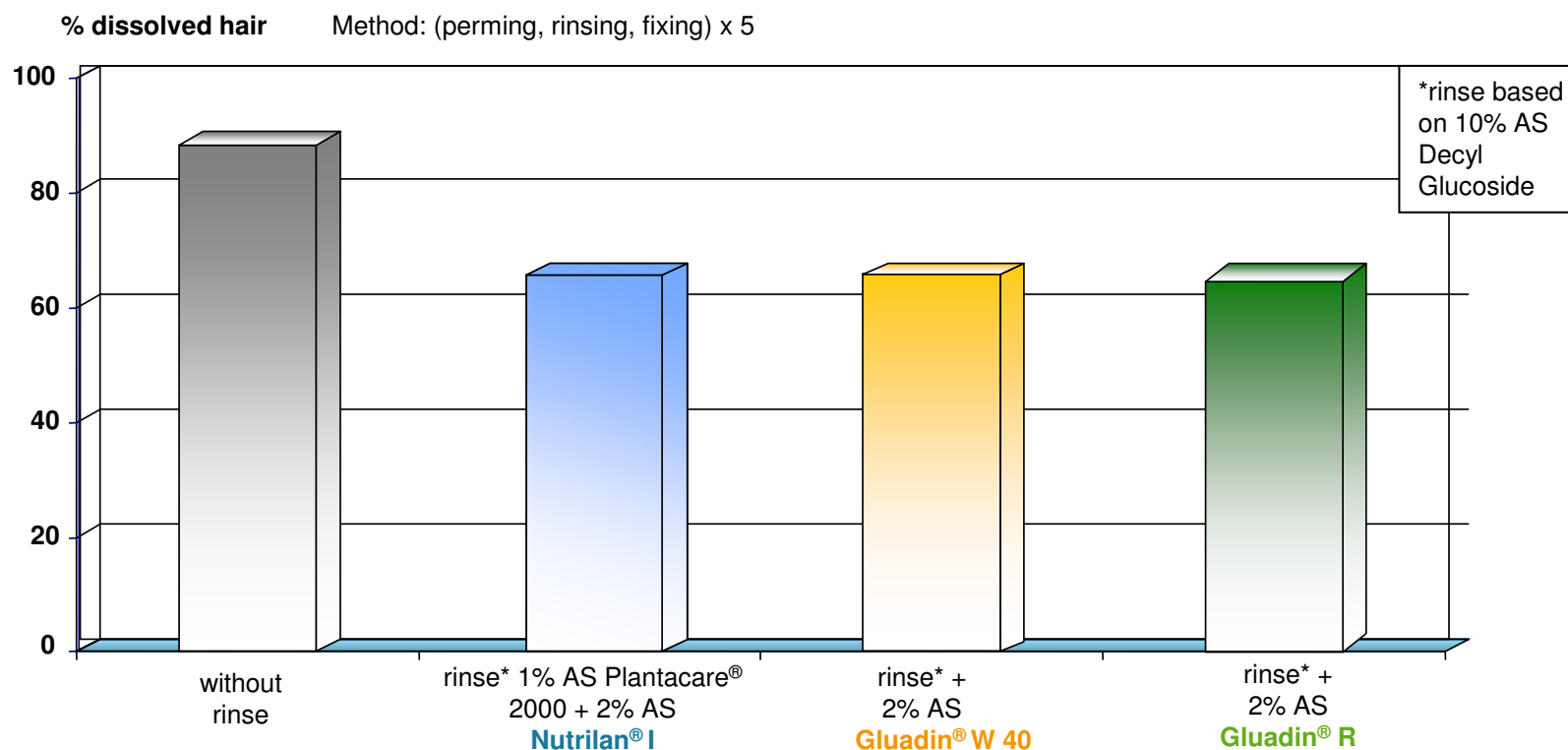
Bending strength
determination device

How Proteins Protect & Care



Hair Protection – Reduction of Alkaline Solubility

Determined by the ammount of dissolved hair substance



How Proteins Protect & Care



Hair Protection

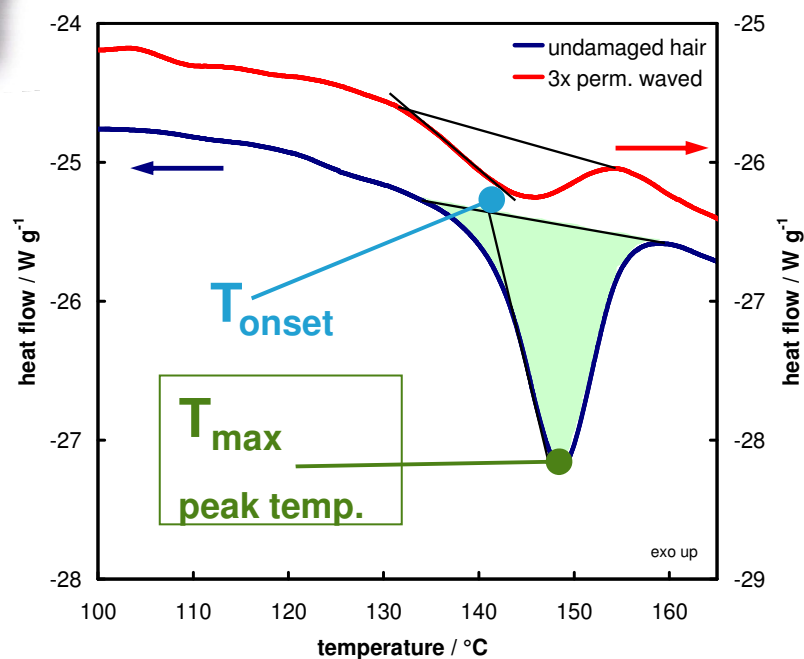
Determined by DSC Measurement

DSC – Differential Scanning Calorimetry

Measuring of the irreversible denaturation of hair proteins

DSC curve results

Healthy hair shows a distinctive curve flow whereas damaged hair has a lower denaturation temperature and shows a flat curve.



How Proteins Protect & Care

Hair Protection

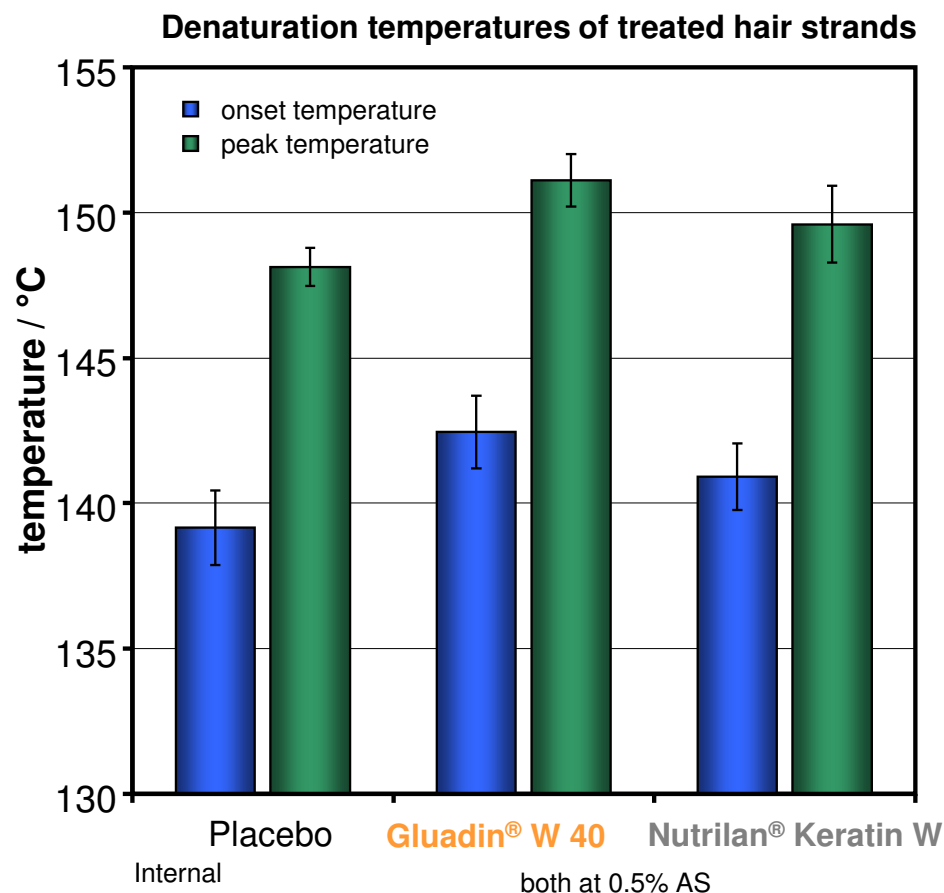
Determined by DSC Measurement after bleaching and perming

Result

Both hydrolysates show a significant protection effect out of a simple leave-on conditioner formulation

	----- weight% -----		
Dehyquart® L 80	2.0	2.0	2.0
Lamesoft® PO 65	2.0	2.0	2.0
Gluadin® W 40 BP	---	1.25	---
Nutrilan® Keratin W PP	---	---	2.5
NaOH (10%)	0.5	0.7	0.2
Water	93.0	94.05	93.3

image: user Pom via Wikimedia



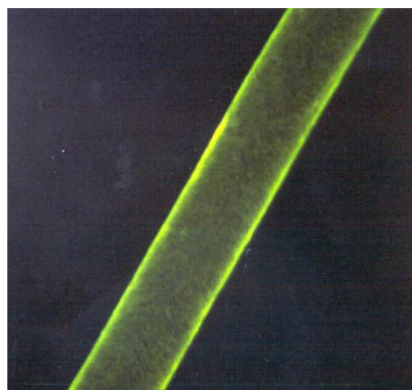
How Proteins Protect & Care

Protection & Repair

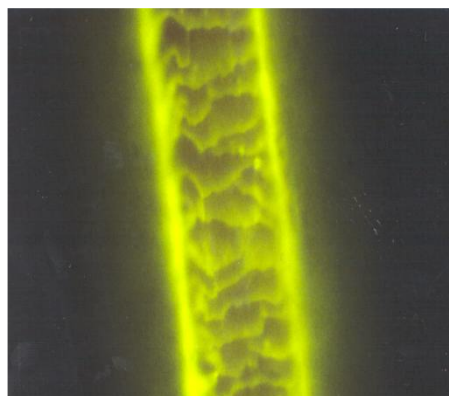
Determined by fluorescence microscopy

Marker: Fluorescein-isothiocyanate

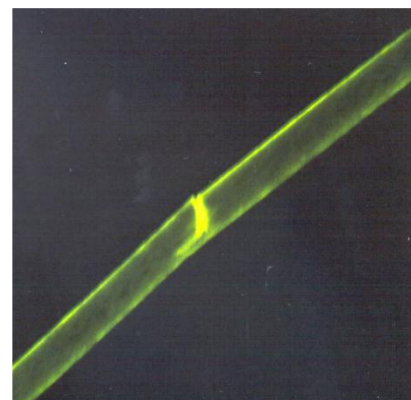
Studies with **Gluadin® Soy**



Formation of a
protection shield



Preferably at cuticle
edges, fracture sites



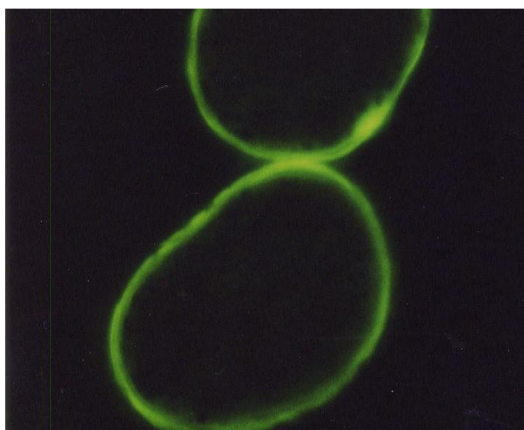
Restructuring of
the cuticle

How Proteins Protect & Care

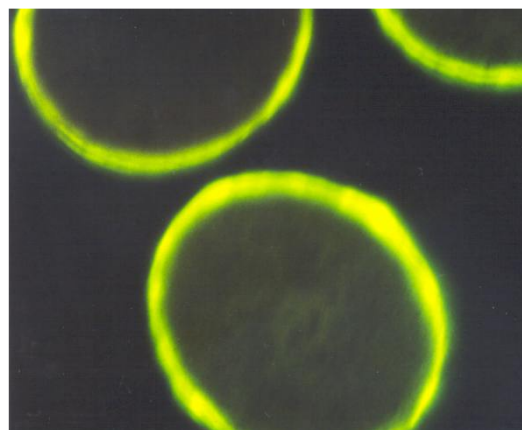
Protection & Repair

Determined by fluorescence microscopy

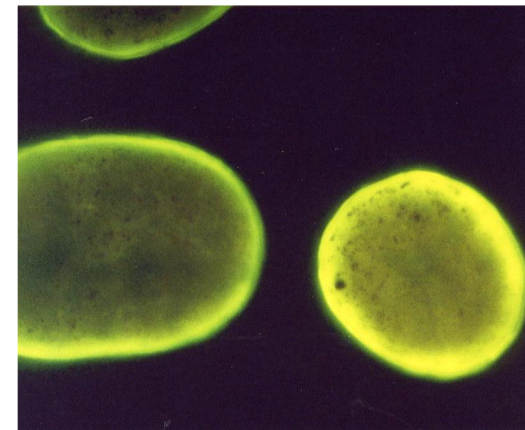
Marker: Fluorescein-isothiocyanate



Surface adhesion
e.g. by **Gluadin® W 40**



Medium penetration
e.g. by **Gluadin® Soy**



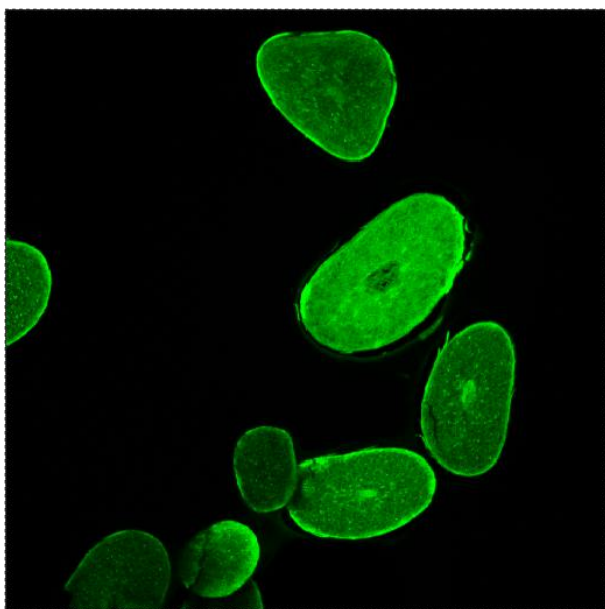
Deep penetration
e.g. by **Gluadin® WLM**

How Proteins Protect & Care

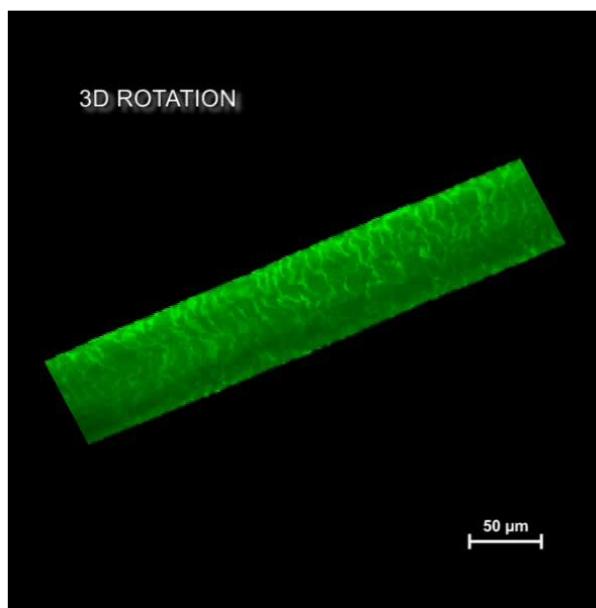
Protection & Repair – Deep Penetration

Determined by **confocal** fluorescence microscopy

Marker: Fluorescein-isothiocyanate



Bleached hair treated with
2% labelled **Gluadin® WLM**



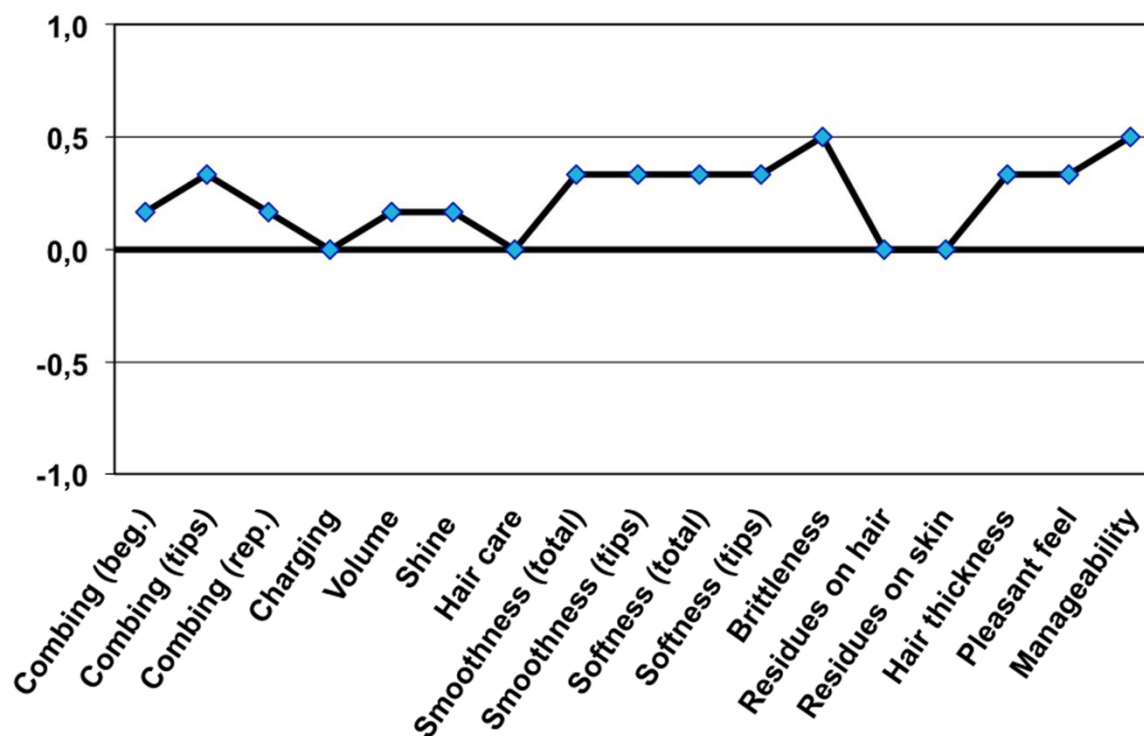
Permed hair treated with
0.4% labelled **Gluadin® WLM**

How Proteins Protect & Care



Hair Feel Improvement

Sensory Assessment of a Hair Conditioner



Hair conditioner with
3% AS
Nutrilan® Milk

- Pleasant feel
- Softness
- Smoothness

How Proteins Protect & Care



Benefits of Quaternized Hydrolysed Proteins e.g. Gluadin® WQ PP and Gluadin® WQTM P

- Higher film formation & conditioning compared to hydrolysates
- Anti-static effect
- Anti-tangling effect
- No build-up effect
- Skin feel additive in shower and bath preparations
- Compatibility with anionic surfactants
- Suitable for 2 in1 products

...and skin feel additive in shampoos, shower and bath preparations for healthy skin...

How Proteins Protect & Care



Proteins for Healthy Skin – Benefits & Claims

- Vitalisation*
- Protection*
- Mildness*
- Skin Compatibility Improvement*
- Elasticity*
- Skin Sensation
- Film Forming
- Smoothness
- Softness
- Suppleness
- Conditioning



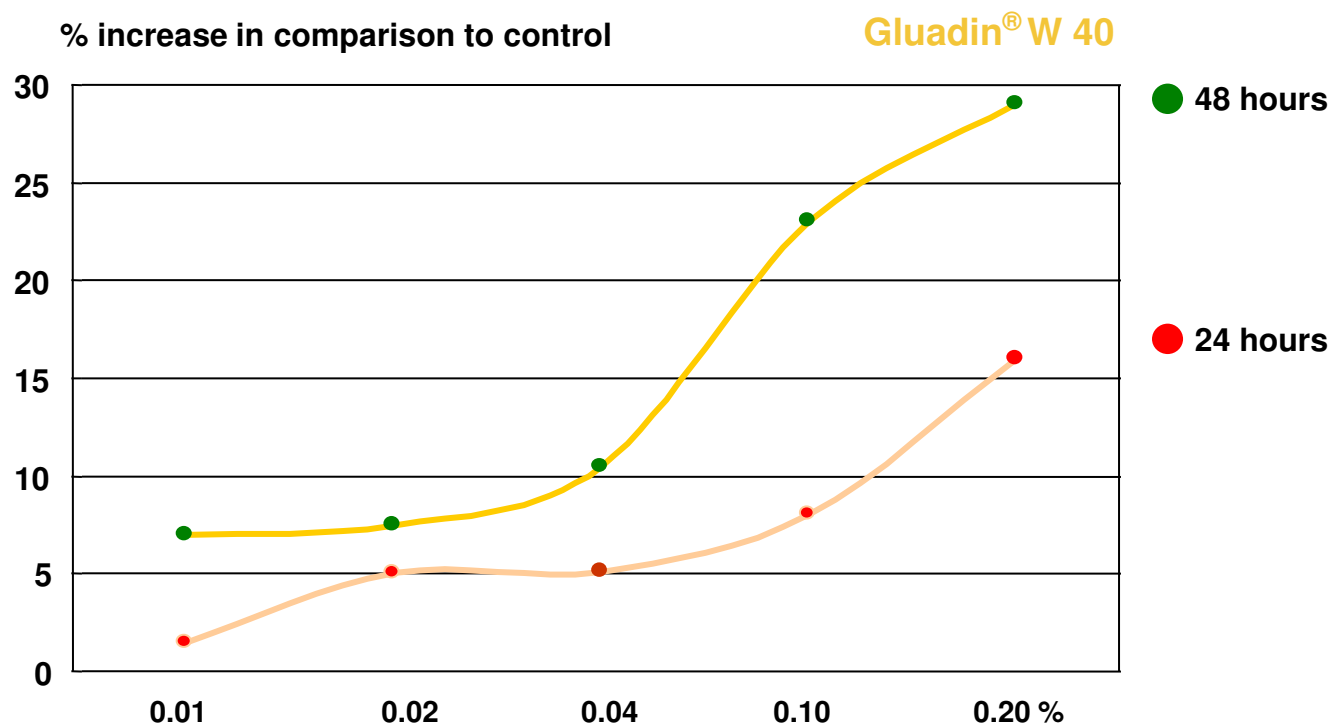
* For these claims efficacy proofs are available

Internal

How Proteins Protect & Care



Vitalisation by Stimulation of Cell Proliferation in vitro with fibroblasts in MTT test incl. spectrophotometry

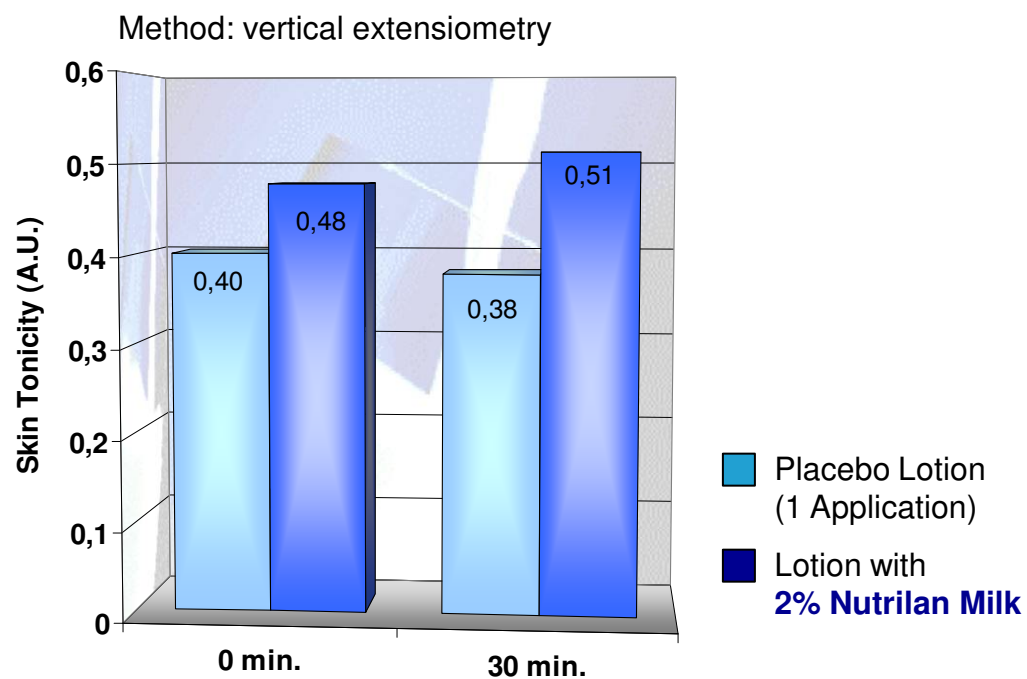


How Proteins Protect & Care



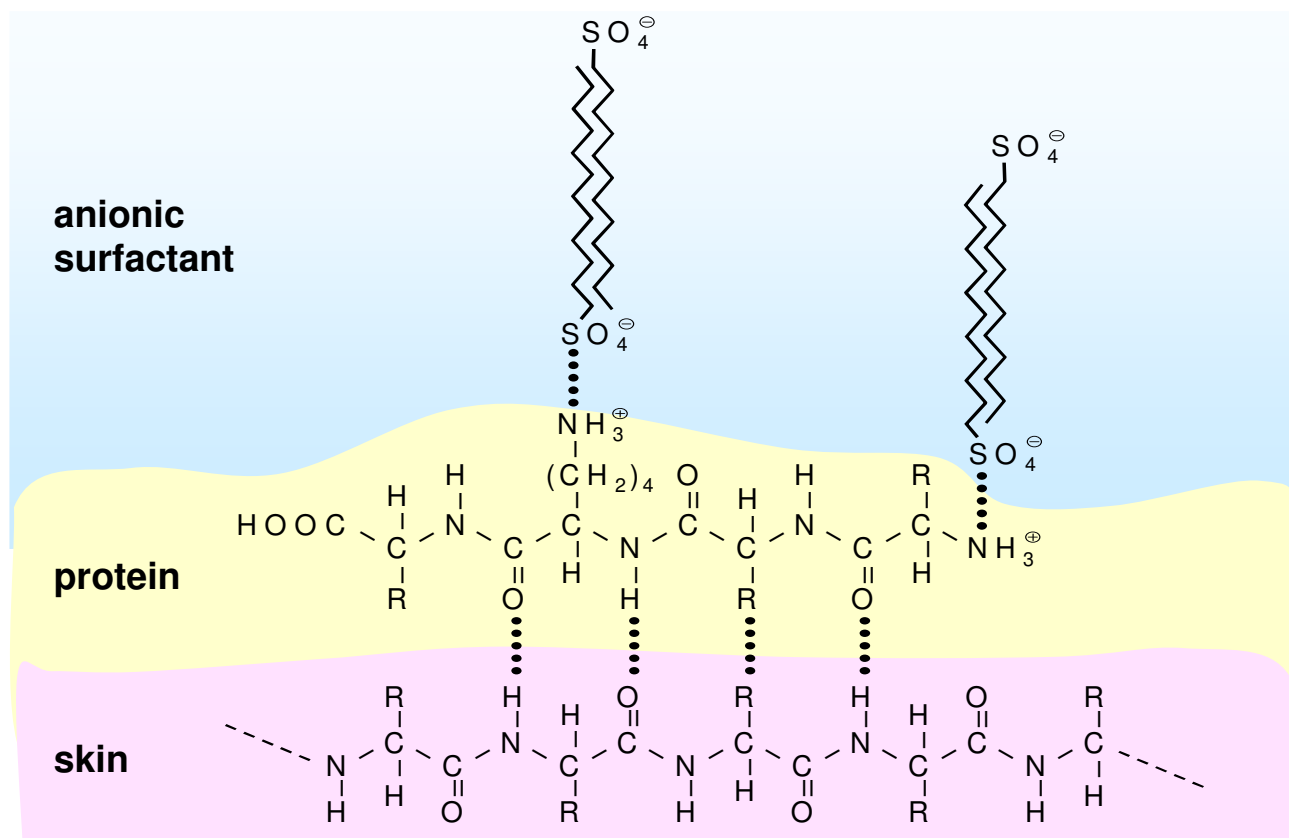
Skin Elasticity and Texture Improvement

Determined by tonicity values with cutometer



How Proteins Protect & Care

Model for the Reduction of Irritation Potential



How Proteins Protect & Care

Mildness & Protection

by Skin Irritation Improvement - Epicutaneous Patch Test
(20 subjects, 24 h, 2% WAS)

Surfactant formulations

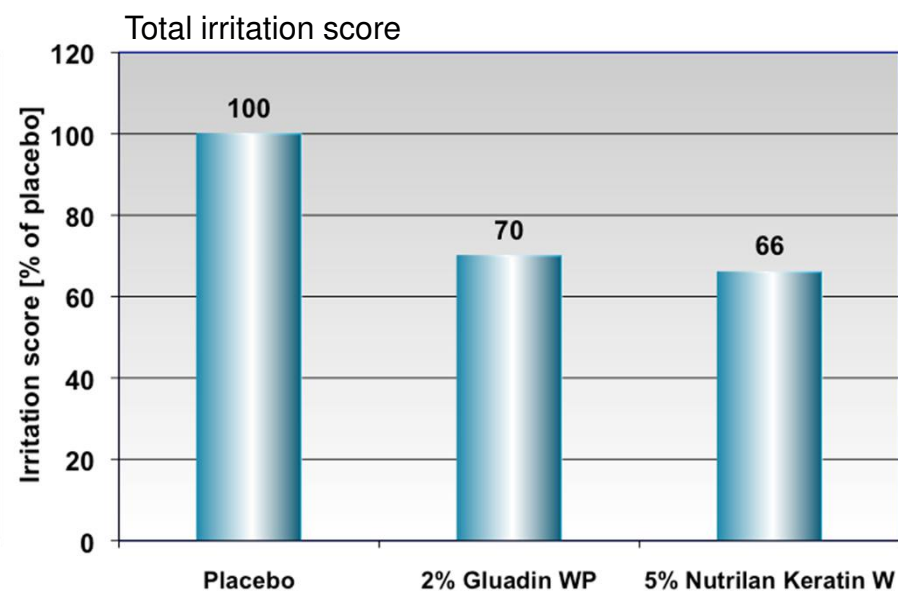
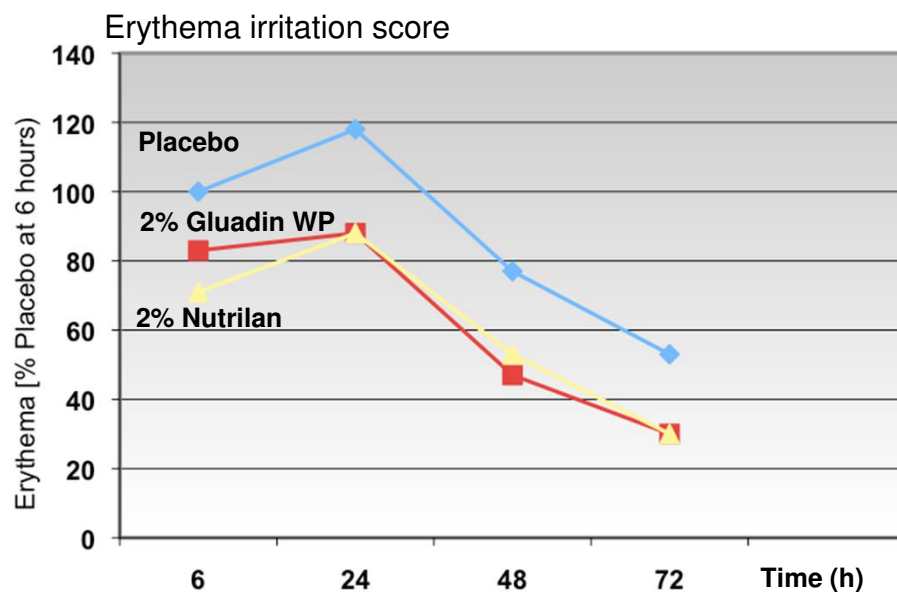
	----- weight % -----		
Texapon® N 70	14.3	14.3	14.3
Dehyton® PK 45	5.4	5.4	5.4
Nutrilan® Keratin W	---	---	5.0
Gluadin® WP	---	2.0	---
Sodium Benzoate	0.5	0.5	0.5
Perfume	0.3	0.3	0.3
Citric Acid	0.7	0.5	0.6
Sodium Chloride	1.35	1.85	1.35
Water	77.45	75.15	72.55
pH value	4.8	4.8	4.7

How Proteins Protect & Care

Mildness & Protection

by Skin Irritation Improvement - Epicutaneous Patch Test

(20 subjects, 24 h, 2% WAS)



Both Products make a surfactant formulation milder!!!

How Proteins Protect & Care

Mildness & Protection

by Skin Irritation Improvement - Epicutaneous Patch Test
(20 subjects, 24 h, 2% WAS)

“Green” surfactant formulations with Gluadin® WP

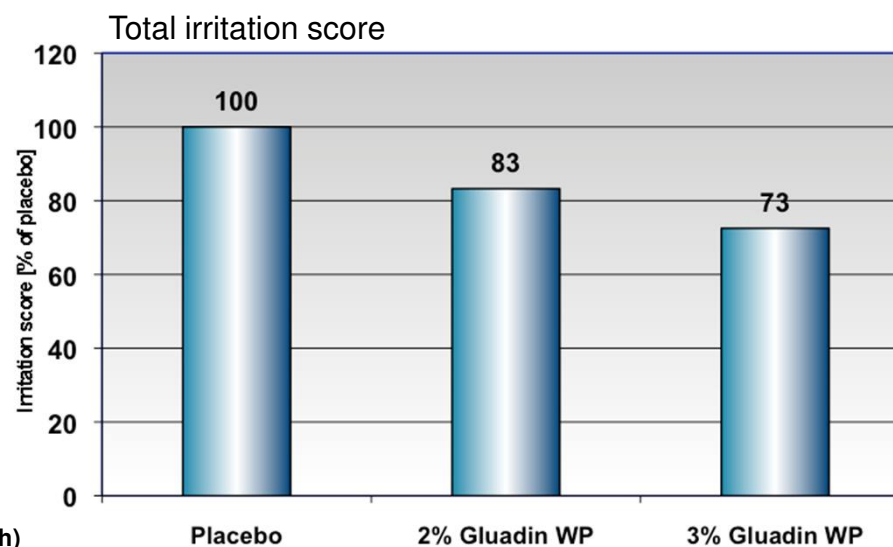
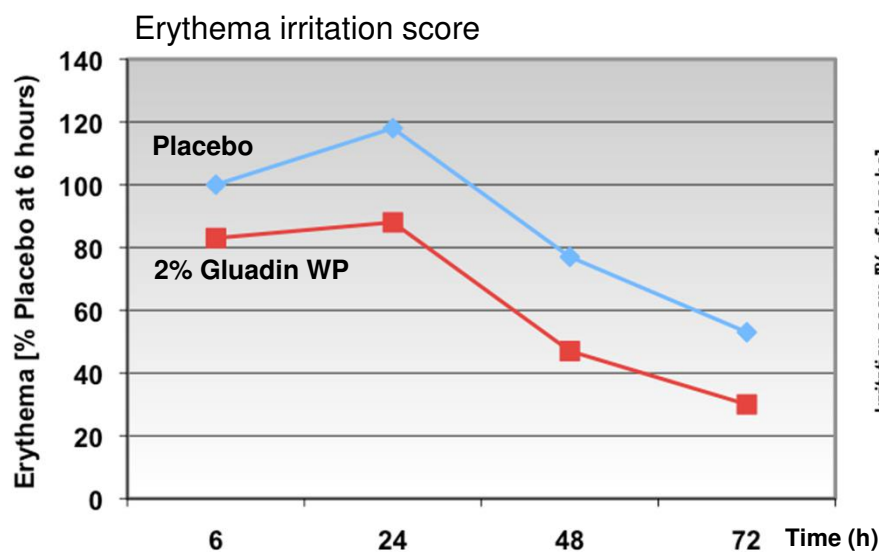
	----- weight % -----		
Sulfopon® 1216G	10.8	10.8	10.8
Plantacare® 818UP	19.2	19.2	19.2
Gluadin® WP	---	2.0	3.0
Lamesoft® PO 65	2.0	2.0	2.0
Sodium Benzoate	0.5	0.5	0.5
Perfume	0.3	0.3	0.3
Citric Acid	2.0	1.7	1.3
Sodium Chloride	0.6	1.1	1.0
Water	64.6	62.4	61.9
pH value	5.0	4.9	5.0

How Proteins Protect & Care

Mildness & Protection

by Skin Irritation Improvement - Epicutaneous Patch Test

20 subjects, 24 h, 2% WAS - "Green" surfactant formulations

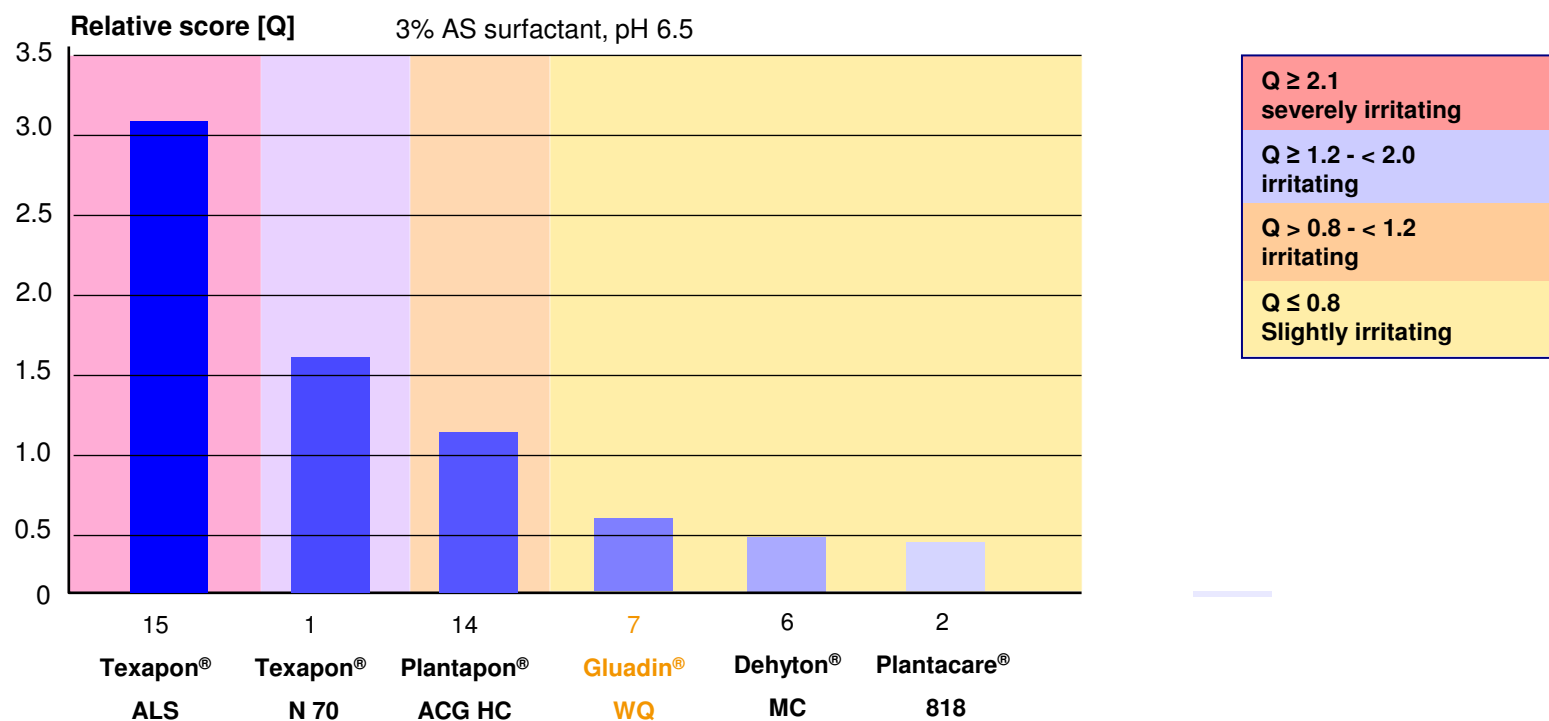


Gluadin® WP dose-dependently decrease the skin irritation potential

How Proteins Protect & Care

Mildness by Skin Compatibility Improvement

Mucous membrane compatibility in vitro (HET CAM)
with an anionic protein surfactant and a quarternized protein hydrolysate



How Proteins Protect & Care

Naturalness and suitability for labels

Product name	Eco Status	Ecocert 	BDIH 	EU-Label 	Nordic Swan 	COSMOS	Natrue 
Gluadin® Almond Benz		approved	suitable	suitable	suitable	approved	approved
Gluadin® AGP		-	-	suitable	suitable	-	-
Gluadin® R Benz		approved	suitable	suitable	suitable	approved	approved
Gluadin® Soy Benz		-	suitable	suitable	suitable	-	-
Gluadin® W 20		not applicable	not applicable	suitable	suitable*	not applicable	not applicable
Gluadin® W 40 BP		not applicable	not applicable	suitable	suitable*	not applicable	not applicable
Gluadin® WP		approved	approved	suitable	suitable	approved	approved
Gluadin® WLM Benz		approved	approved	suitable	suitable	approved	approved
Gluadin® WQ PP		not applicable	not applicable	suitable *	suitable*	not applicable	not applicable
Gluadin® WQTM P		not applicable	not applicable	suitable *	suitable*	not applicable	not applicable
Nutrilan® I 50 BP		not applicable	not applicable	suitable *	suitable	not applicable	not applicable
Nutrilan® Keratin W PP		not applicable	not applicable	suitable *	suitable*	not applicable	not applicable
Nutrilan® Milk		not applicable	not applicable	-	-	not applicable	not applicable
Lamepon® S PC		not applicable	not applicable	-	-	not applicable	not applicable
Lamequat® L		not applicable	not applicable	-	-	not applicable	not applicable

* Internal
Residue concentration permitted according to EU Directive 2007/506/EC

Disclaimer



While the descriptions, designs, data and information contained herein are presented in good faith and believed to be accurate, it is provided for your guidance only. Because many factors may affect processing or application/use, we recommend that you make tests to determine the suitability of a product for your particular purpose prior to use.

NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESIGNS, DATA OR INFORMATION MAY BE

USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS. IN NO CASE SHALL THE DESCRIPTIONS, INFORMATION, DATA OR DESIGNS PROVIDED BE CONSIDERED A PART OF OUR TERMS AND CONDITIONS OF SALE.