

Carboxymethylglucan

Beauty from yeasts

Carboxymethylglucan



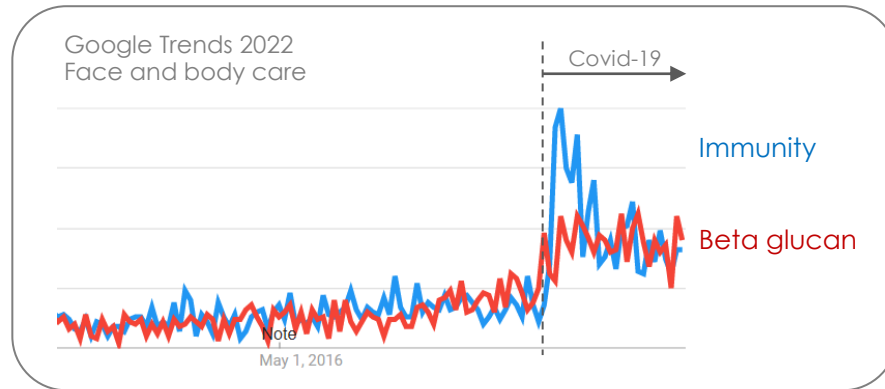
- Chemically modified beta-glucan from baker's yeast *Saccharomyces cerevisiae*
- **Sustainable biotechnological production**
- **INCI:** Sodium Carboxymethyl Beta-Glucan
- **China** compliant
- **Form:** water-soluble powder



Beta glucans



- Very potent **immunomodulators**
- Long history as **dietary supplements**
 - => Immunity boosters
- New post-covid cosmetic trend
 - => **Skin immunity** support
 - => **Immunocosmetics**
 - => **Increased awareness of β -glucans**



... TO COSMETICS



FROM DIETARY SUPPLEMENTS...

Carboxymethylglucan

Structure

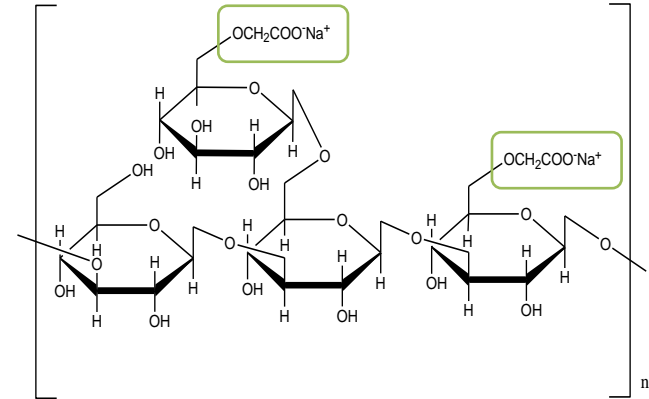
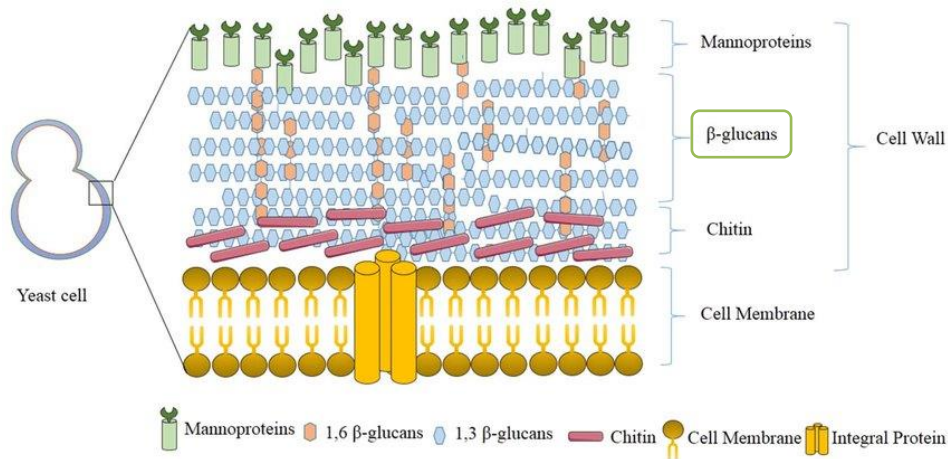
- Polysaccharide β -1,3 glucan with β -1,6 branching
- Yeast β -glucan is **insoluble in water**
- **Carboxymethylation** => water **solubility**

β -glucans

different sources

=> different structures

=> different properties



Carboxymethylglucan



Key properties

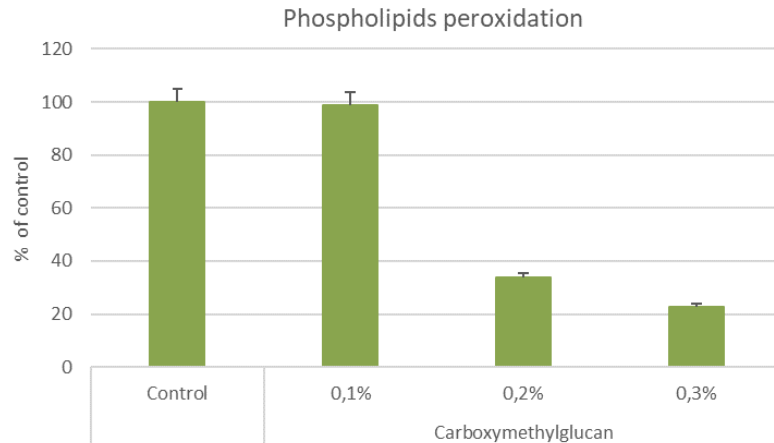
- **Anti-inflammatory** effects
- Direct **antioxidant** effects
- Stimulates skin **natural antioxidant defensive mechanisms**
- Reduces **skin pores** and **roughness**
- Stimulates **collagen** production => increases skin **elasticity**, reduces **wrinkles**
- Increases **hydration, skin barrier function**

CMG has antioxidant effects



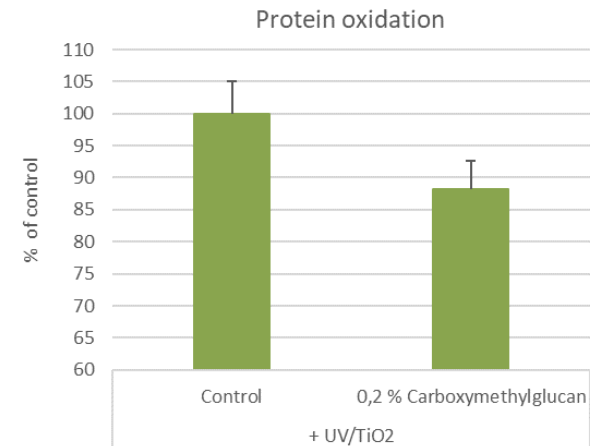
Experimental details

- Phospholipids + H₂O₂
- 0,1-0,3 % CMG
- TBARS assay



Experimental details

- Bovine serum albumin + TiO₂ (photocatalyst, free radical generator) + UVA/UVB
- 0,2 % CMG
- DNPH assay



CMG stimulates skin antioxidants

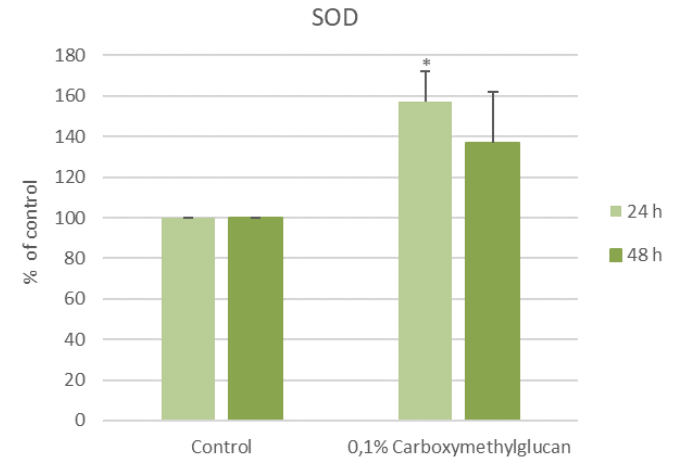
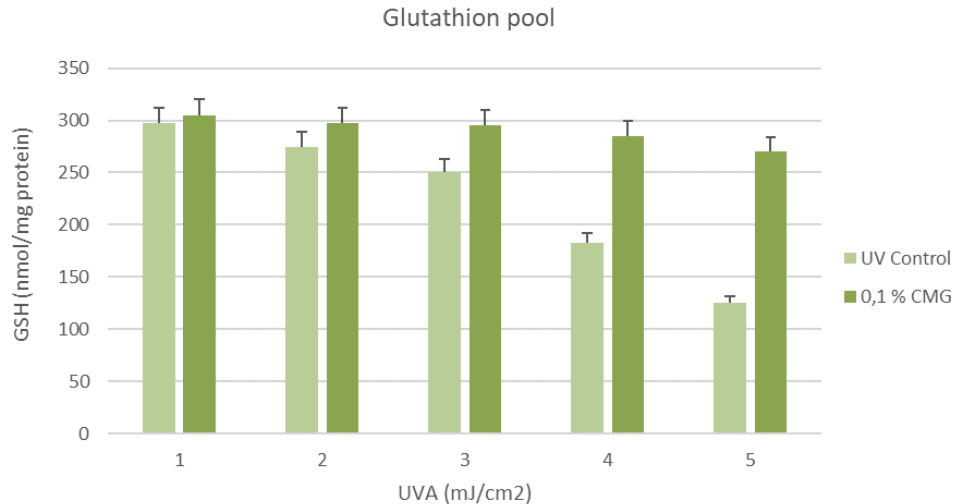


Experimental details

- HaCaT keratinocytes
- 0,1 % CMG
- 2-8 mJ/cm² UVB
- 24 h
- **Glutathion** – potent antioxidant

Experimental details

- HaCaT keratinocytes
- 0,1 % CMG
- 24, 48 h
- **Superoxid dismutase**
– enzyme neutralizing free radicals

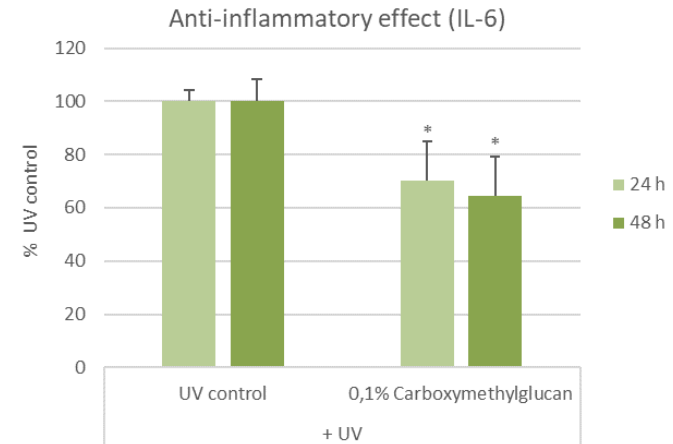
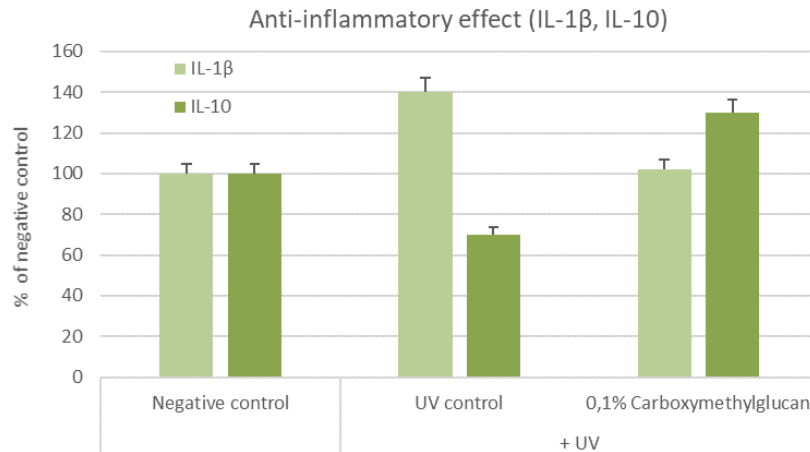


CMG has anti-inflammatory effects



Experimental details

- HaCaT keratinocytes,
- 0,1 % CMG
- 5 mJ/cm² UVB, 24-48 h
- CMG reduces pro-inflammatory cytokines IL-1 β (qRT-PCR) and IL-6 (ELISA)
- CMG increases anti-inflammatory cytokine IL-10 (qRT-PCR)



CMG *in vivo* studies



1st study

- Double-blind, randomized
- 7 women/1 man
- 26-50 years, 31,5 average

2nd study

- Double-blind, randomized
- 6 women
- 26-30 years, 27,8 average

3rd study

- Double-blind, randomized
- 30 women
- 35-60 years, 44,6 average



- 0,005 % CMG in emulsion
- Placebo emulsion
- 12 weeks

- 0,1 % CMG in emulsion
- Placebo emulsion
- 6 weeks

- 0,1 % CMG in emulsion
- Placebo emulsion
- 6 weeks

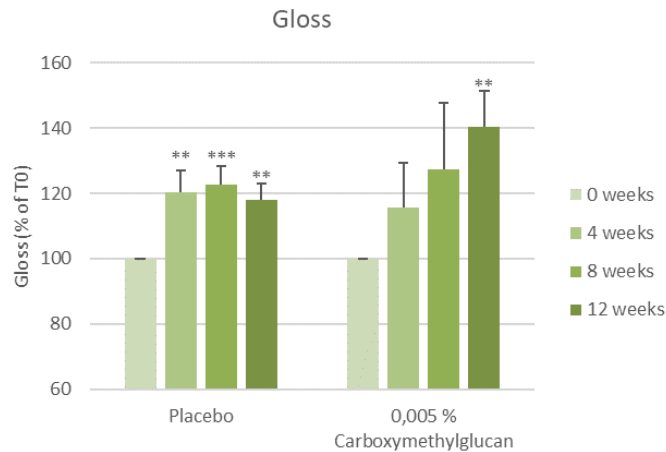
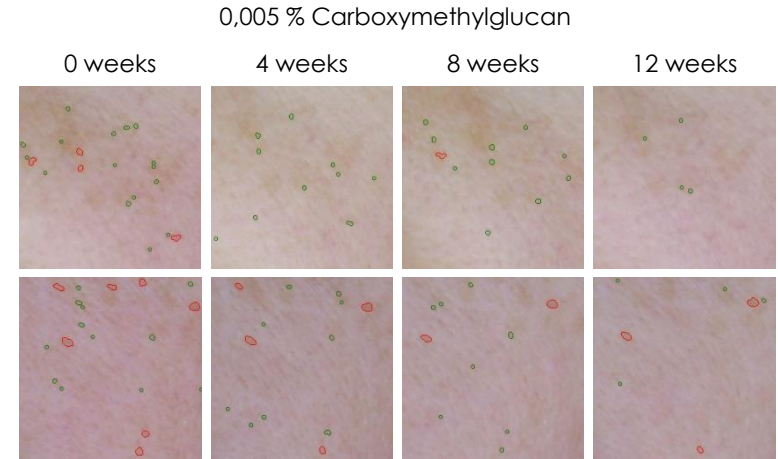
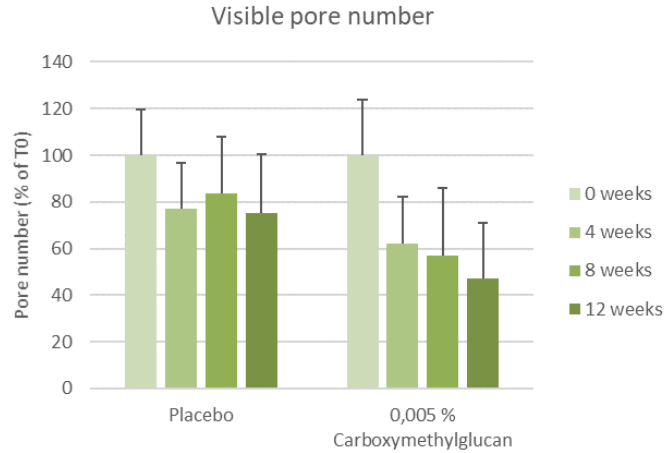


- Corneometer: hydration
- Tewameter: TEWL
- Glossymeter: skin gloss
- VisioFace: pores
- Cutometer: elasticity

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- Cutometer: elasticity

- Collagen fibers: Vivascope
- Primos 3D camera: wrinkles

CMG reduces skin pores and roughness



CMG reduces skin pores and increases skin gloss
= skin appears smoother

CMG improves skin elasticity



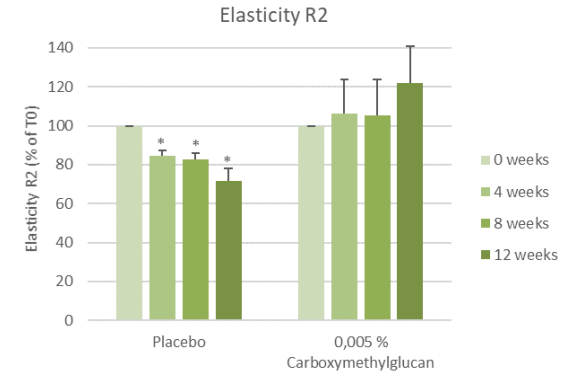
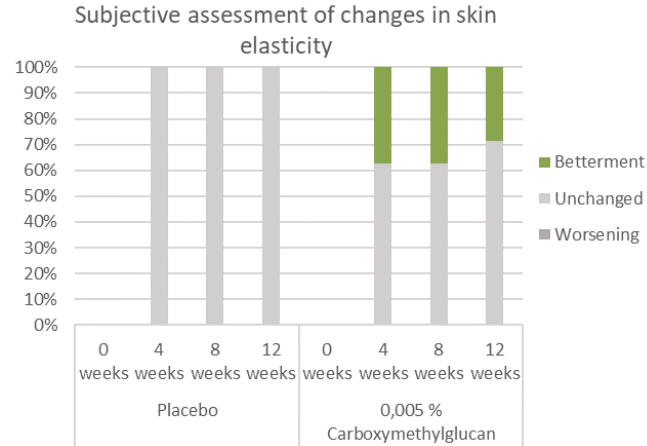
Cutometry

- R2 (gross elasticity)
- R5 (net elasticity)
- R7 (biologic elasticity)

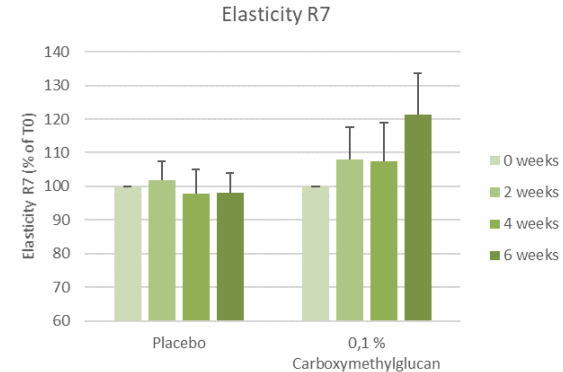
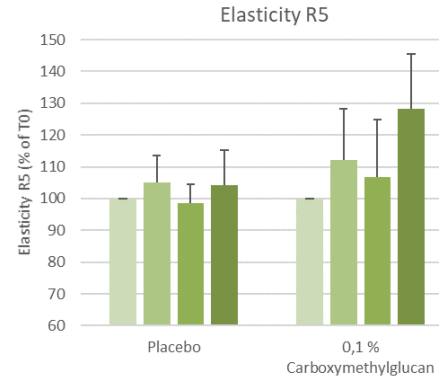
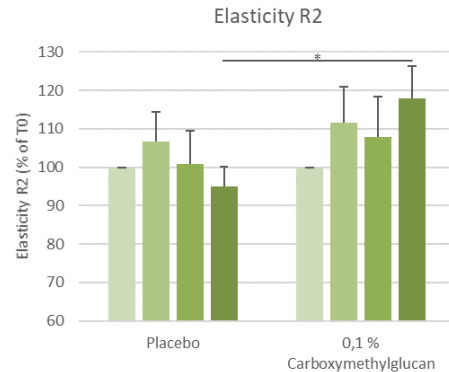


1st study
(0,005 % CMG)

Questionnaire:



2nd study
(0,1 % CMG)

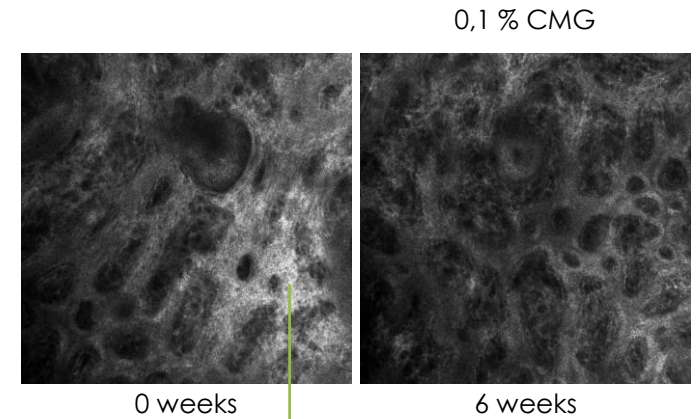
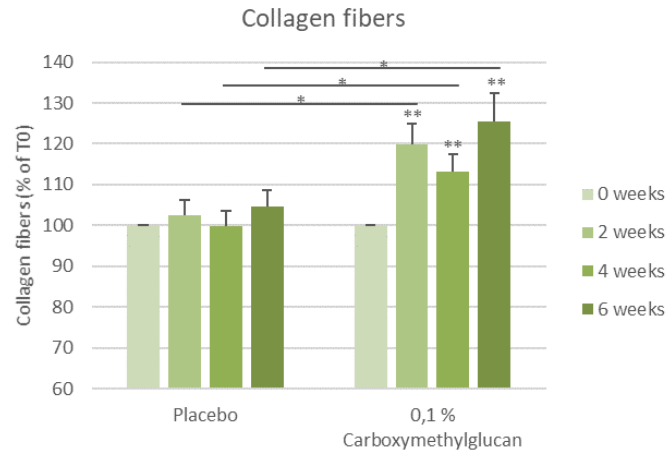


CMG increases collagen, reduces solar elastosis



3rd study

- Collagen fibers
- Vivascope (*in vivo* reflectance confocal microscopy)
- Image analysis of collagen fibers

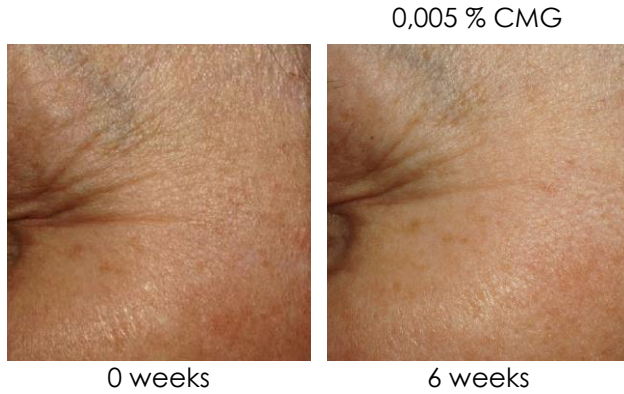


Solar elastosis (clumps of damaged elastic fibers)

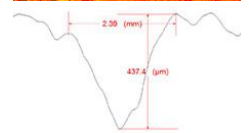
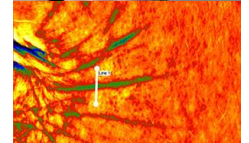
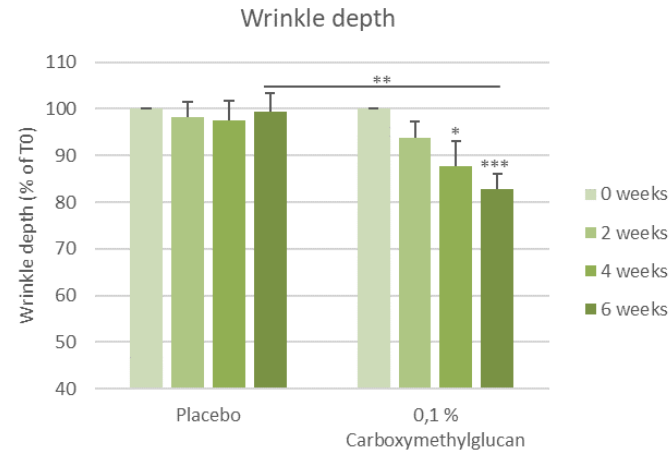
CMG reduces wrinkles



1st study
(0,005 % CMG)



3rd study
(0,1 % CMG)



0,1 % CMG



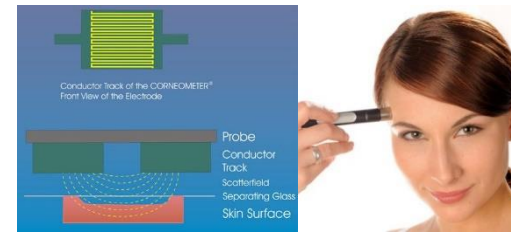
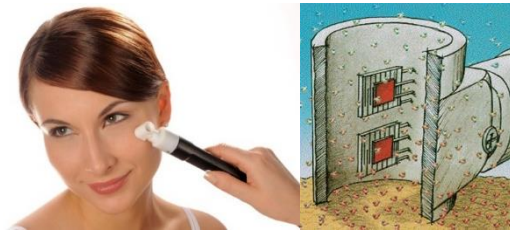
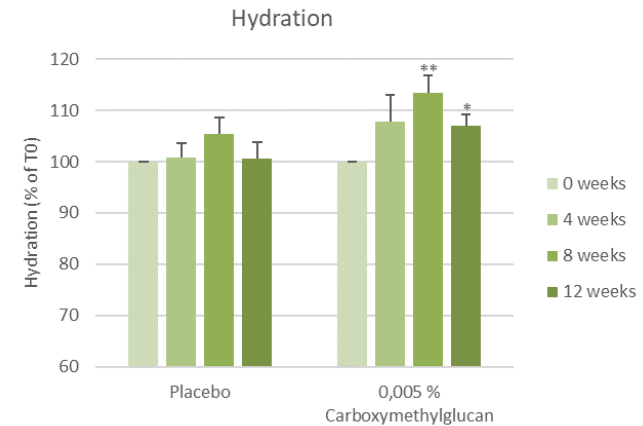
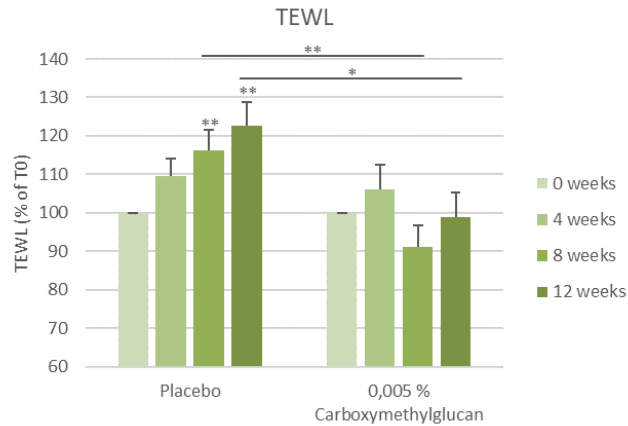
0 weeks

6 weeks

CMG improves skin barrier function and hydration



1st study
(0,005 % CMG)



Carboxymethylglucan - conclusion



- Water-soluble **beta-glucan** from **yeast** *Saccharomyces cerevisiae* (baker's yeast)
 - **Anti-inflammatory** effects
 - Direct **antioxidant** effects
 - Stimulates skin **natural antioxidant defensive mechanisms**
 - Reduces **skin pores**, increases gloss => reduces **skin roughness**
 - Stimulates **collagen** production => increases skin **elasticity**, reduces **wrinkles**
 - Increases **skin hydration, barrier function**
-
- + **Anti-pollution** effect => see separate presentation
 - + Prebiotic for the **skin microbiome** support => see separate presentation



Sustainable
production



China
compliant

Carboxymethylglucan – technical sheet



INCI name: Sodium Carboxymethyl Beta-Glucan

Samples: 1g

Minimal ordering quantity: 1 kg

(If ordering smaller quantities, the price can increase due to handling fees)

Recommended concentration: 0.01 – 0.1 %

Appearance: white to slightly yellow powder or granules

Supplied form: powder

Source: Carboxymethylglucan is obtained by chemical modification of insoluble beta-glucan isolated from the cell walls of yeast *Saccharomyces cerevisiae* (baker's yeast) cultivated in special growth medium under well-defined conditions.

Shelf-life: 24 months

Compatibility and processing: Stable in a broad range of pH (4–9). Stable at higher temperature (80 °C) for 45 minutes.

Solubility: Carboxymethylglucan is soluble in water. Solution may be slightly turbid, the turbidity depends on the concentration. Soluble in the mixture of ethyl alcohol, isopropyl alcohol, propylene glycol and butylene glycol with water up to ratio 1:1. Insoluble in non-water miscible solvents.