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Care Ingredients

Our knowledge. Your formulations.

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BergaSom

A deep dive into the functions and potential of the skin’s own phospholipids



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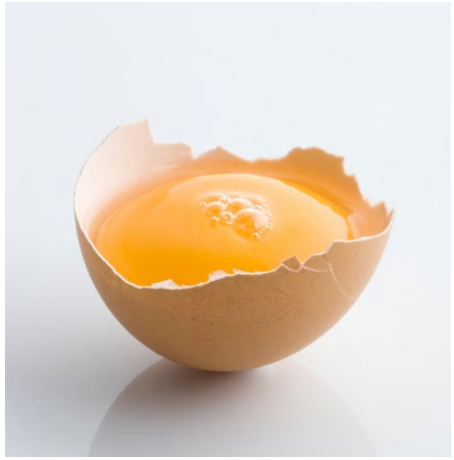
Introduction Lecithins

Lecithin and Phospholipids

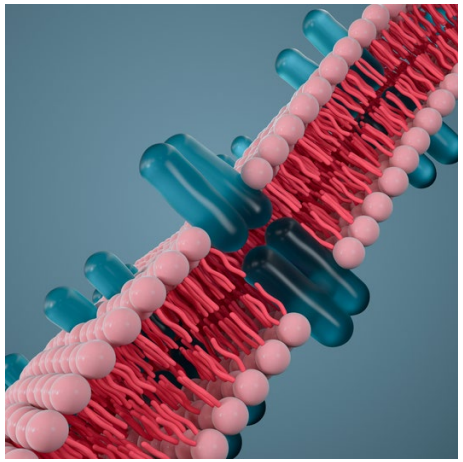
Lecithin

Same, same, but different









- Lecithin naturally occurs in animal and plant bio membranes (egg yolk, fish eggs, brain and liver cells).
- Lecithin is a mixture of different phospholipids.
- Phospholipids provide flexibility and support the substance transport through the cell membrane.
- Phosphatidylcholine is one particular phospholipid.

Lecithins in Cosmetics

Applications

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Skin Care

- Emulsifier in light products
- Face and body care products
- Dermo-cosmetics (→ DMS creams)
- Luxury, high-end segment



Hair Care

- Mainly lyso-lecithin
- Used as smoothing, nourishing and moisturzing ingredient
- Conditioning agent in shampoos
- Provides gloss



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Introduction Lecithins

Shared Knowledge for Success

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WE FUTURE FOOD

Cutting-edge, application-oriented lecithin and lipid solutions

Multifunctional cosmetic ingredients to improve the skin health of every individual.

sternlife inspiring nutrition
HERZA CHOCNOLOGY
Sternchemie
SternMaid contract manufacturing service
STERNVITAMIN Micronutrients for a Healthy Life
SternEnzym The Enzyme Designer
hydrosol We texture taste.
planteneers The Plant Based Pioneers
MC Mühlenchemie Understanding Flour
deutscheback Together. Better Baking.
olbrichtarom creating better taste
SternProServ Procure, provide, proceed.

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Berg+Schmidt Animal Nutrition
For extra performance.

BergaSom

Purified Phosphatidylcholine

- Derived from sunflower and soy (non-GMO)
- Usage for a variety of different function in modern and safe cosmetic formulations
- Actives or functional ingredient
- Lecithin → penetration enhancement, supports cell renewal, acts as skin strengthening agent and improves the sebum quality of acne-prone skin.
- Hydrogenated Lecithin → provide co-emulsifying properties for sophisticated sensory qualities and an improved skin feel.



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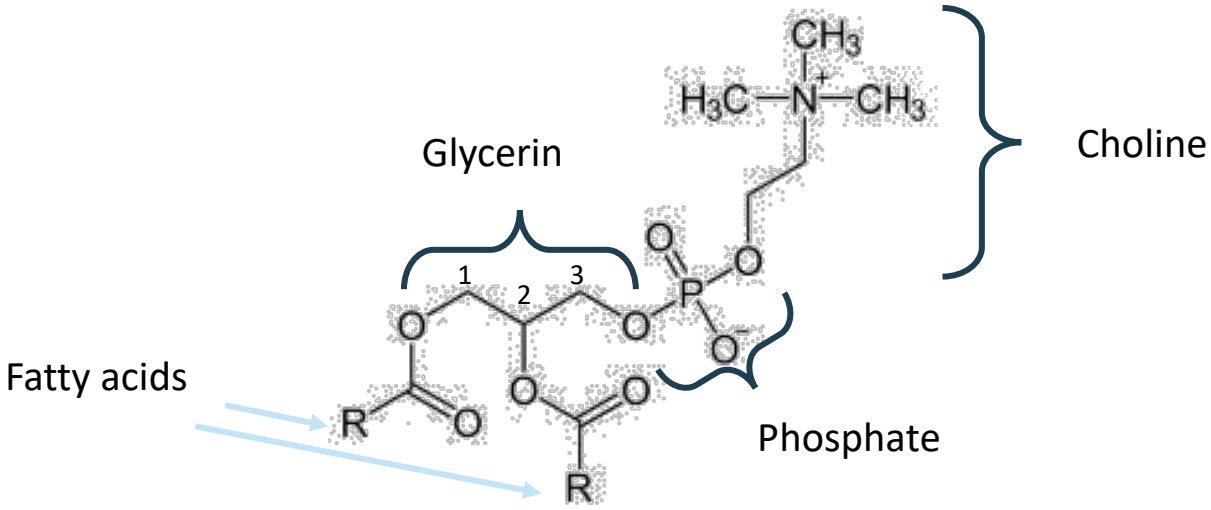
Lecithin ≠ Lecithin

From commodity to high-tech product

Lecithin ≠ Lecithin

Structure of Phospholipids/Phosphatidylcholine

- Glycerin backbone, esterified at positions 1 and 2 with fatty acids
- Esterified with phosphate at position 3
- Phosphate is further esterified with an alcohol, e.g. choline in case of Phosphatidylcholine



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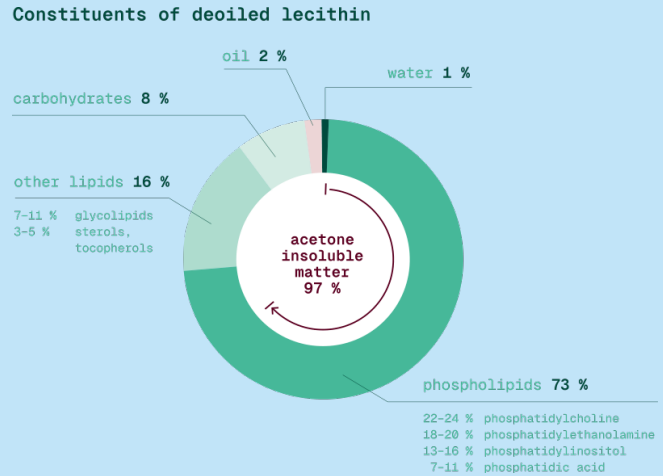
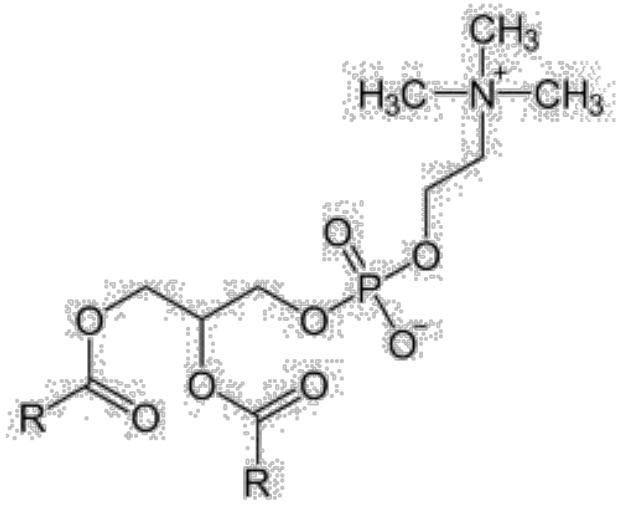


Lecithin ≠ Lecithin

Structure of Phospholipids/Phosphatidylcholine

- Phosphatidylcholine (PC) is an amphoteric molecule
- At pH 7, molecule is neutral in sum, at pH below 7, molecule is cationic
- When mixed into water, PC spontaneously forms various structures depending on geometry of the molecule



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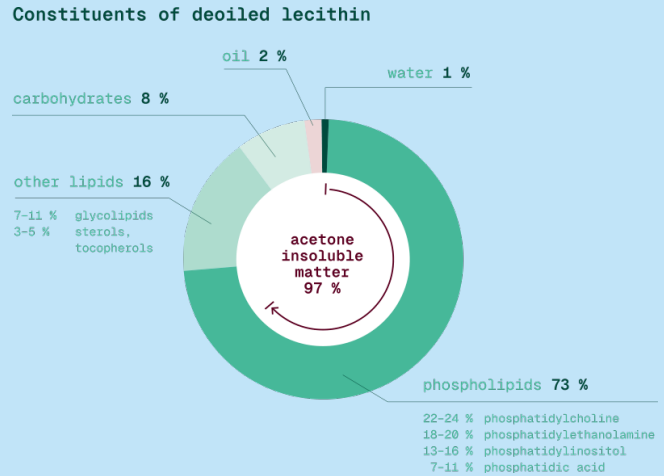
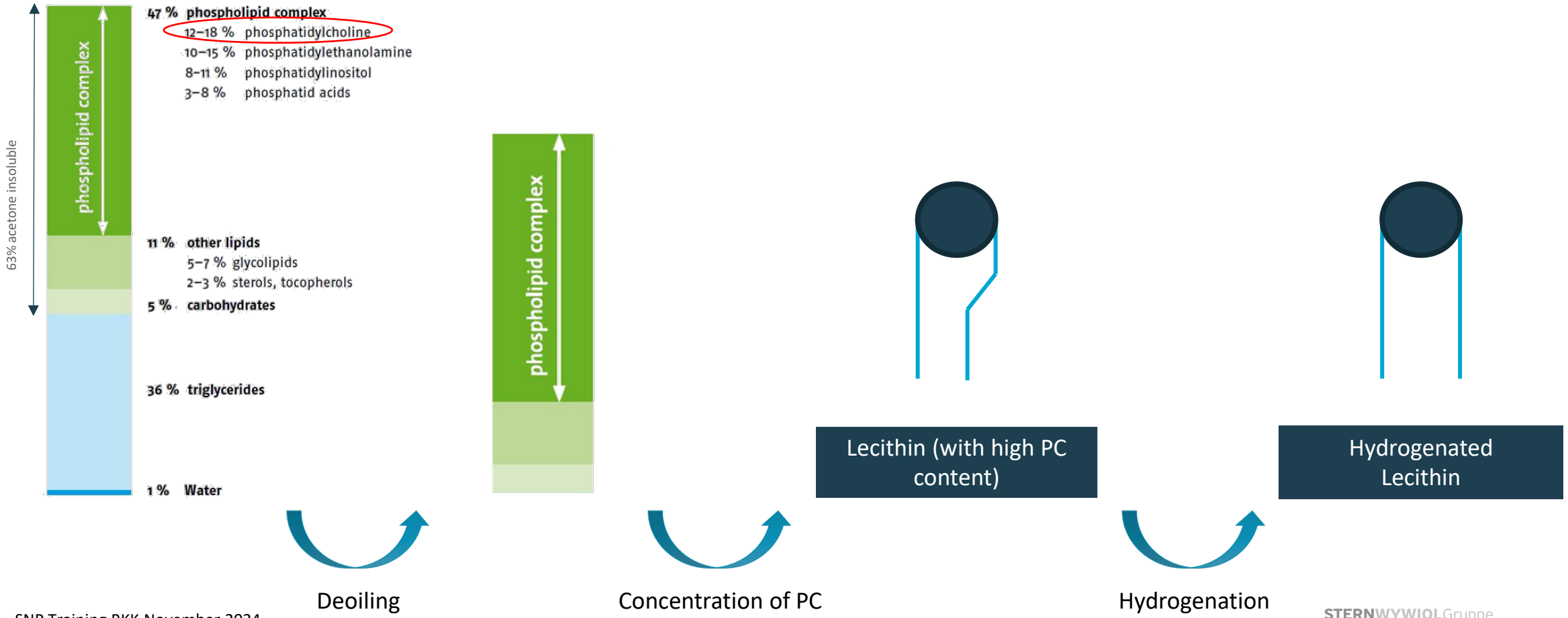


Lecithin ≠ Lecithin

From commodity to high-tech product



Lecithin ≠ Lecithin

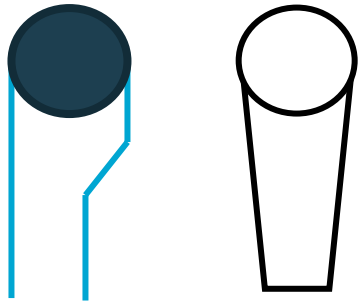
Spontaneously formed structures



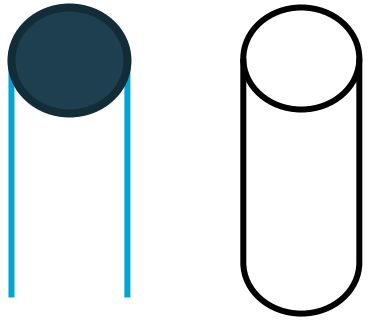
BergaSom
(yellow to brown paste)
50-90% PC



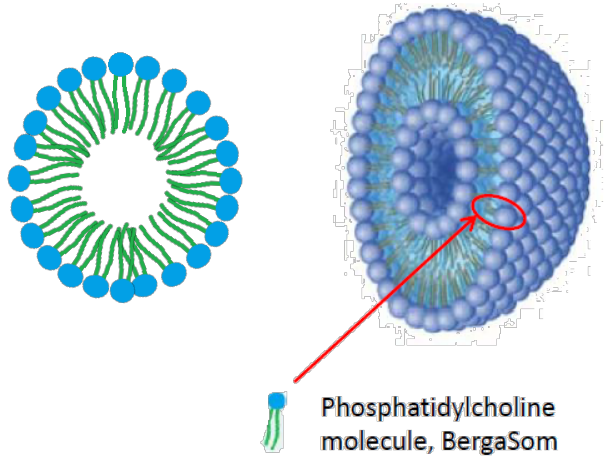
BergaSom H
(white to yellowish powder)
70-90% PC

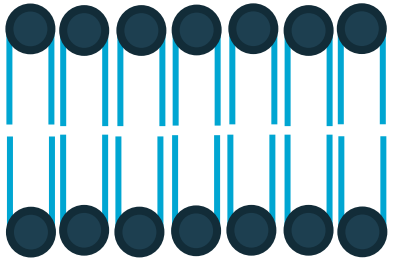


Non-hydrogenated



Hydrogenated





Spherical lamellar
Prone to oxidation
Cool storage

2D lamellar
Not sensitive to oxidation
Storage at RT

Lecithin ≠ Lecithin

From commodity to high-tech product



Standard Lecithin
(brownish oil)
~15% PC

Deoiling



Deoiled Lecithin (yellow powder)
~24% PC

Concentration of PC



BergaSom
(yellow to brown paste)
50-90% PC

Hydrogenation



BergaSom H
(white to yellowish powder)
70-90% PC

INCI: Lecithin	INCI: Hydrogenated Lecithin
commodity, low PC content	high-tech product, high PC content

Typical fatty acid distribution of the phospholipids

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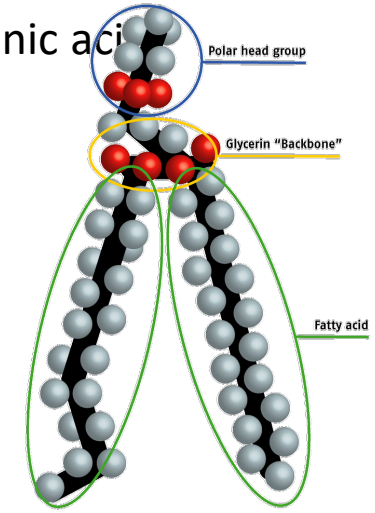
- Similar to the typical composition of the oil of the used plant source
- High amount of C18:2 (linoleic acid, omega-6), furthermore significant amounts of C18:1 (oleic acid) and C18:3 (linolenic acid, omega-3)



%	BergaSom Soy 90	BergaSom Sun 90
C14:0	0.07	0.07
C16:0	10.40	7.70
C16:1	0.10	0.07
C18:0	2.90	2.00
C18:1	8.80	15.50
C18:2	70.10	73.90
C18:3	7.20	0.30
C20:0	0.20	0.20
C20:1	0.07	0.10

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BergaSom Range

BergaSom Sun

Product	INCI	Applications
BergaSom Sun 75	Lecithin	1,5-3,0%
BergaSom Sun 75H	Hydroginated Lecithin	1,5-3,0%
BergaSom Sun 90	Lecithin	1,5-3,0%
BergaSom Sun 90H	Hydroginated Lecithin	1,5-3,0%

BergaSom Range

BergaSom Soy

Product	INCI	Applications
BergaSom Soy 75	Lecithin	1,5-3,0%
BergaSom Soy 75 NG	Lecithin NON GMO	1,5-3,0%
BergaSom Soy 75H	Hydroginated Lecithin	1,5-3,0%
BergaSom Soy 75H NG	Hydroginated Lecithin NON GMO	1,5-3,0%
BergaSom Soy 90	Lecithin	1,5-3,0%
BergaSom Soy 90 NG	Lecithin NON GMO	1,5-3,0%
BergaSom Soy 90H	Hydroginated Lecithin	1,5-3,0%
BergaSom Soy 90H NG	Hydroginated Lecithin NON GMO	1,5-3,0%

Lecithin – More than just an emulsifier

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Skin Barrier & Protection

- Acts as a ceramide precursor (phosphatidylcholine → linoleic acid → ceramide I)
- Strengthens and restores the skin barrier
- Stabilizes TEWL (transepidermal water loss), especially hydrogenated lecithin
- Forms DMS-like lamellar structures (Derma Membrane Structures), biomimetic to skin lipids



Hydration & Osmoprotection

- Very high water-binding capacity (up to 20 water molecules per PC molecule)
- Provides long-lasting skin hydration
- Broken down into polar metabolites → osmoprotective effect, increasing cellular water uptake
- In vivo: hydration increases proportionally with phosphatidylcholine content

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Lecithin – More than just an emulsifier

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Anti-Aging Effects

- In vitro: increases hyaluronic acid secretion in fibroblasts.
- Reduces MMP-1 activity → less collagen degradation.
- In vivo: visible reduction in skin roughness (effects seen after 3 days; maintained over 28 days).
- Contributes to smoother, firmer, more elastic skin.

Anti-Inflammatory Activity

- Reduces TNF-α secretion (in vitro)
- Soothes irritated or stressed skin
- Liposomal delivery of actives shows reduced cytotoxicity compared to free actives

Problem Skin

- Acts as a linoleic acid donor → improves sebum quality, reduces comedones
- Proven benefits for acne-prone skin (clinical studies with soy lecithin fractions)
- Supports recovery of dry, damaged, or compromised skin

BergaSom Sun & Soy (non-hydrogenated)

Cosmetic function - Active ingredient

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Primary factors:

- Elevated sebum production
- Disturbance of follicular keratenization

Clinically relevant factors for therapeutic intervention

Secondary factors:

- Follicular inflammation and immune response
- Hyperproliferation of *Propionibacterium acnes*

+ Overproduction of sebum leads to deficiency of linoleic acid and disturbance of lipid synthesis

+ Deficiency of essential fatty acids in sebaceous follicle is buffered by PC

+ Overproduction of sebum leads to deficiency of linoleic acid and distrubance of lipid synthesis

+ Linoleic acid as precursor of 13-HODE (disposes of anti-proliferation properties, inhibits inflammation)

PC is a donor of linoleic and linolenic acid which improves the sebum quality.

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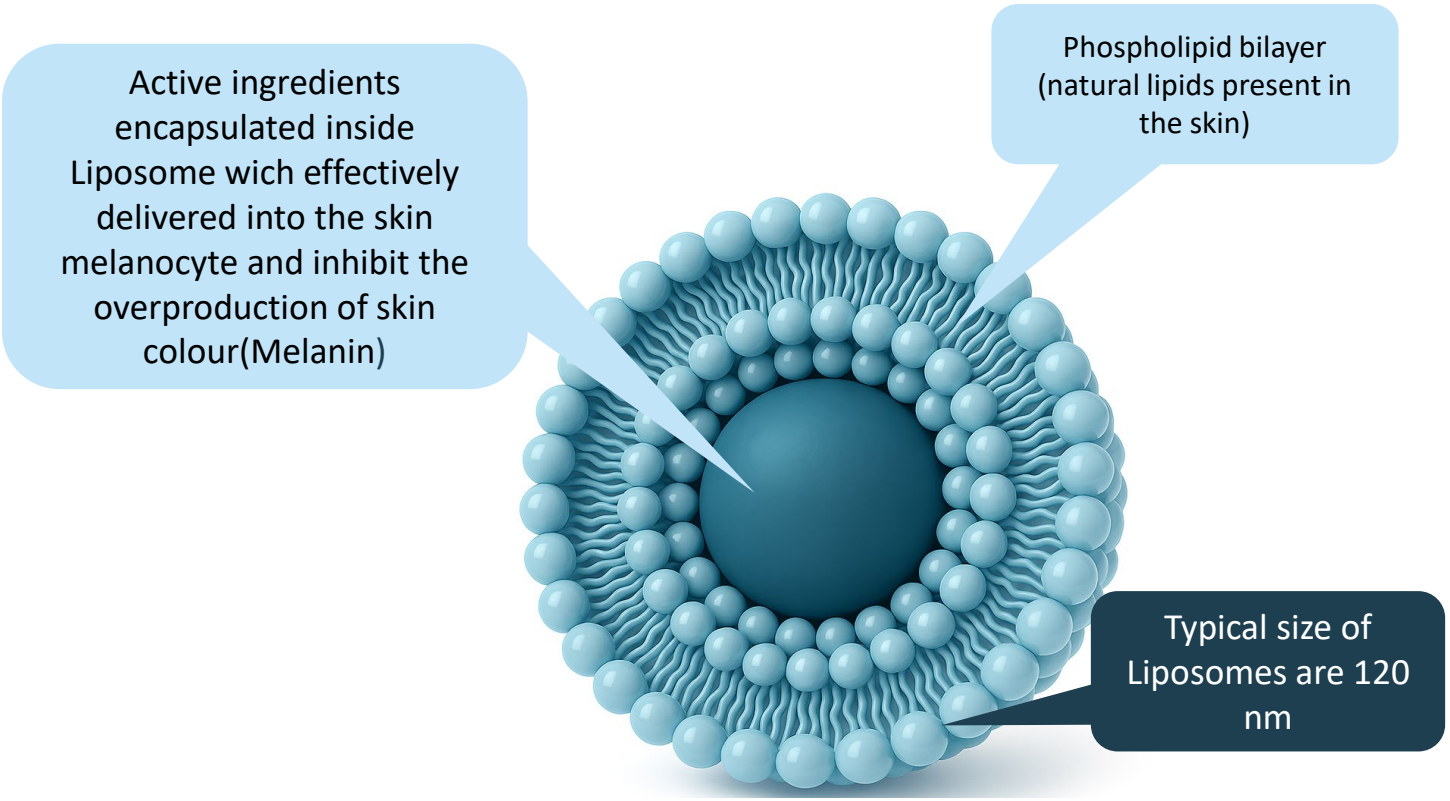
BergaSom Sun & Soy (non-hydrogenated)

Cosmetic function – Liposome precursor



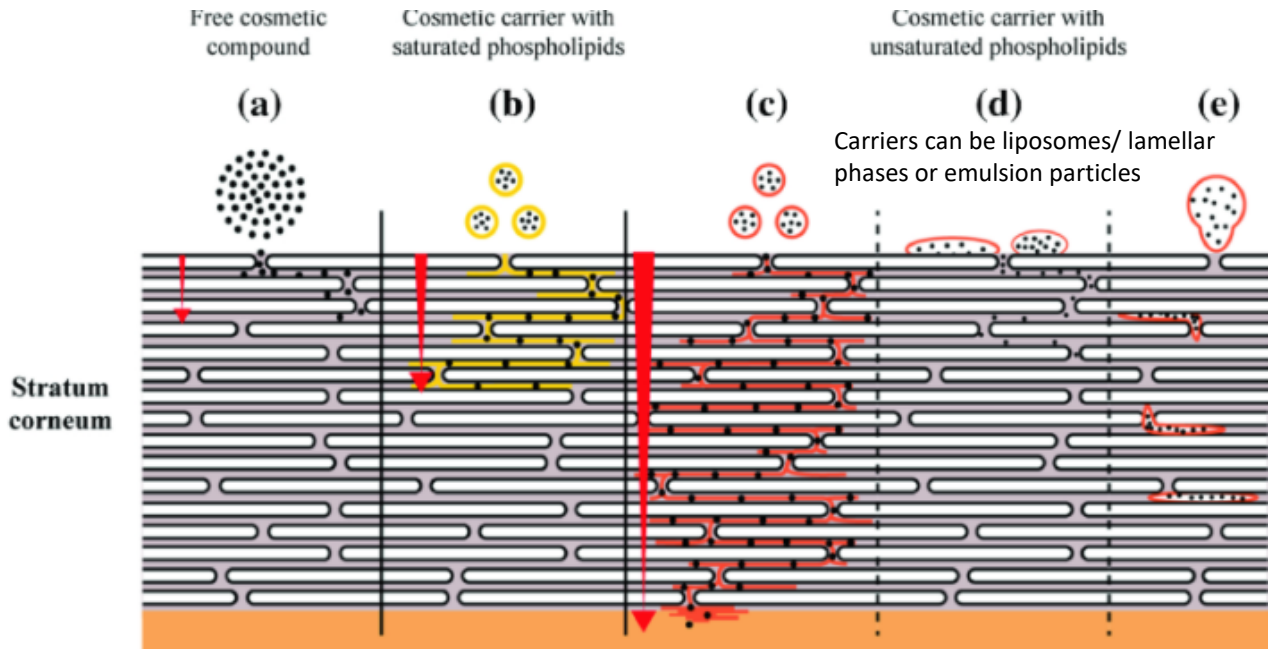
- Can carry hydro- or liposoluble actives
- Vesicles consisting of an aqueous core that is surrounded by a phospholipid-based bi-layer (membrane)
- Neutral liposomes are formulated with phosphatidylcholine (PC) → BergaSom Sun/ Soy 75 or 90
- Liposomes can be stabilized by combining PC with negatively charged phospholipids such as PA or PE

Liposome technology requires specific equipment and knowledge.

BergaSom Sun & Soy (non-hydrogenated)

Cosmetic function – Penetration enhancer

- Corneocytes and intercellular lipids form a horny layer to build the Stratum Corneum
- Protection of the skin against waterloss, external aggressions and pathogens
- Difficult for actives to penetrate, depending on molecule

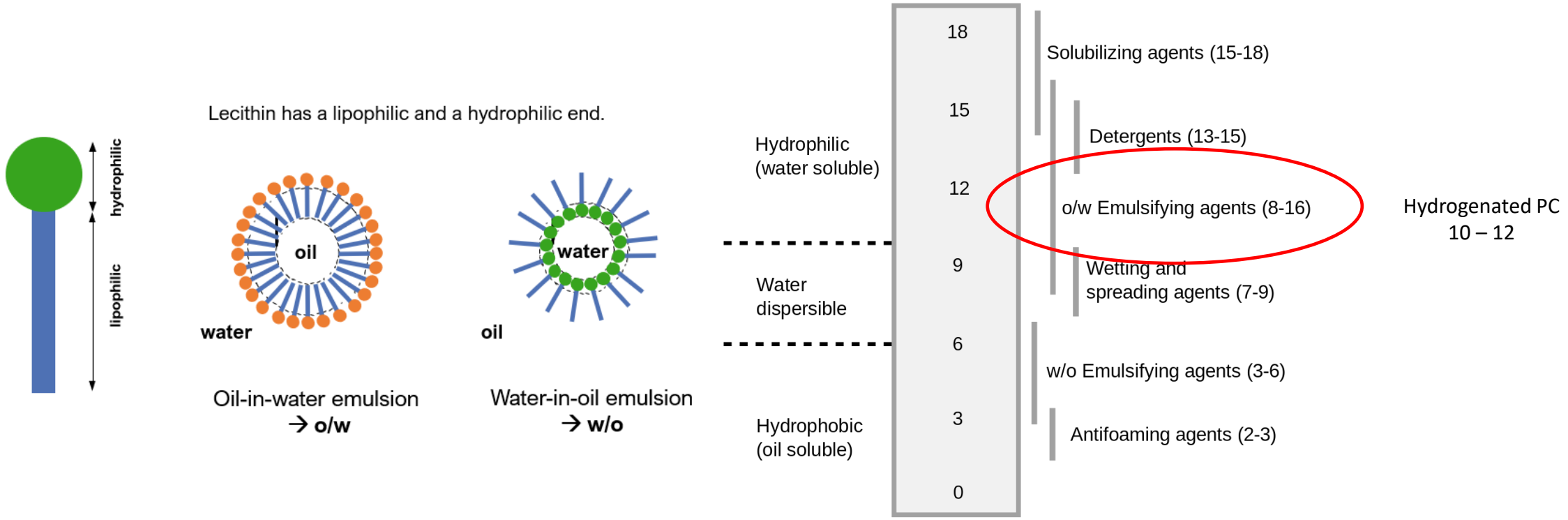


Reference: **van Hogeveest, P.** (2019), Phospholipids in Cosmetic Carriers, *Nanocosmetics*, Springer

Enhanced penetration due to presence of phospholipids e.g. liposomes or emulsion particles.

BergaSom Sun & Soy H (hydrogenated)

Cosmetic function – Emulsifier



BergaSom Sun/ Soy H can be used as single or co-emulsifier.

What makes BergaSom H different from standard emulsifiers?

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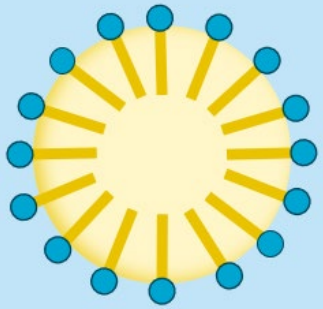
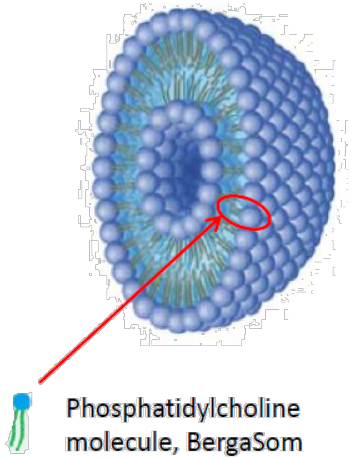
Standard Emulsifiers

- Structure: typical molecule with a clear hydrophilic and lipophilic part
- Function: Sit at the oil-water interface and stabilize emulsions
- Drawbacks: May disrupt the skin barrier and cause irritation, especially in sensitive skin



Hydrogenated Lecithin:

- Structure: amphiphilic, but biologically compatible. Phosphatidylcholine (PC) is an amphoteric molecule. Forms lamellar structures (biomimetic lipid bilayers), mimicking the skin's own lipid layers.
- Not just an emulsifier – acts as a structure former, capable of building vesicular systems (liposomes, lamellar phases)



mimics skin lipids, while traditional emulsifiers just stabilize!

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Why Does BergaSom H improve texture?

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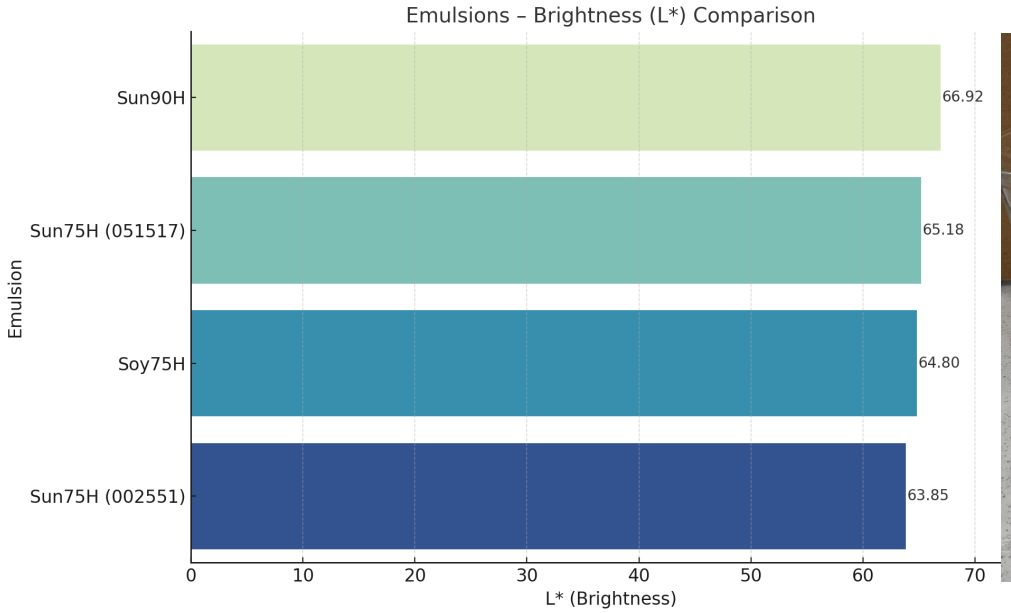
- Lamellar lipid structures give creams a silky, skin-like texture – no greasy or waxy after-feel
- Improved spreadability thanks to the biomimetic lipid alignment
- “Second skin” effect: Light but nourishing – absorbs well and leaves a smooth, soft finish
- Gentle, barrier-friendly ingredients

The skin “recognizes” the structure – that’s why the texture feels so natural and pleasant.

Comparison of Emulsion Brightness (L) Across Lecithin Types





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How the Minolta Colorimeter Works

- Measures reflected light using a built-in standard light source (e.g., D65).
- Records color in the CIE L*a*b* color space (lightness, red/green, yellow/blue).
- Placed directly on the sample for spot measurement.
- Requires calibration with a white reference tile.
- Outputs numerical color values for quality control and batch comparison.

Interpretation of the Results



BergaSom Sun 90H	Lightest and most neutral in color
	Best suited for products where a clean, bright appearance is needed
BergaSom Sun 75H	Sun will be more yellow than Soy 75H variation
	Color still suitable for most applications.
Bergasom Soy 75H	Slight greenish tint and lowest brightness.
	May look cooler or less vibrant than Sun 90H emulsion, but not as yellow as Sun 75H version

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How to use BergaSom?

Manufacturing procedures

How to use BergaSom

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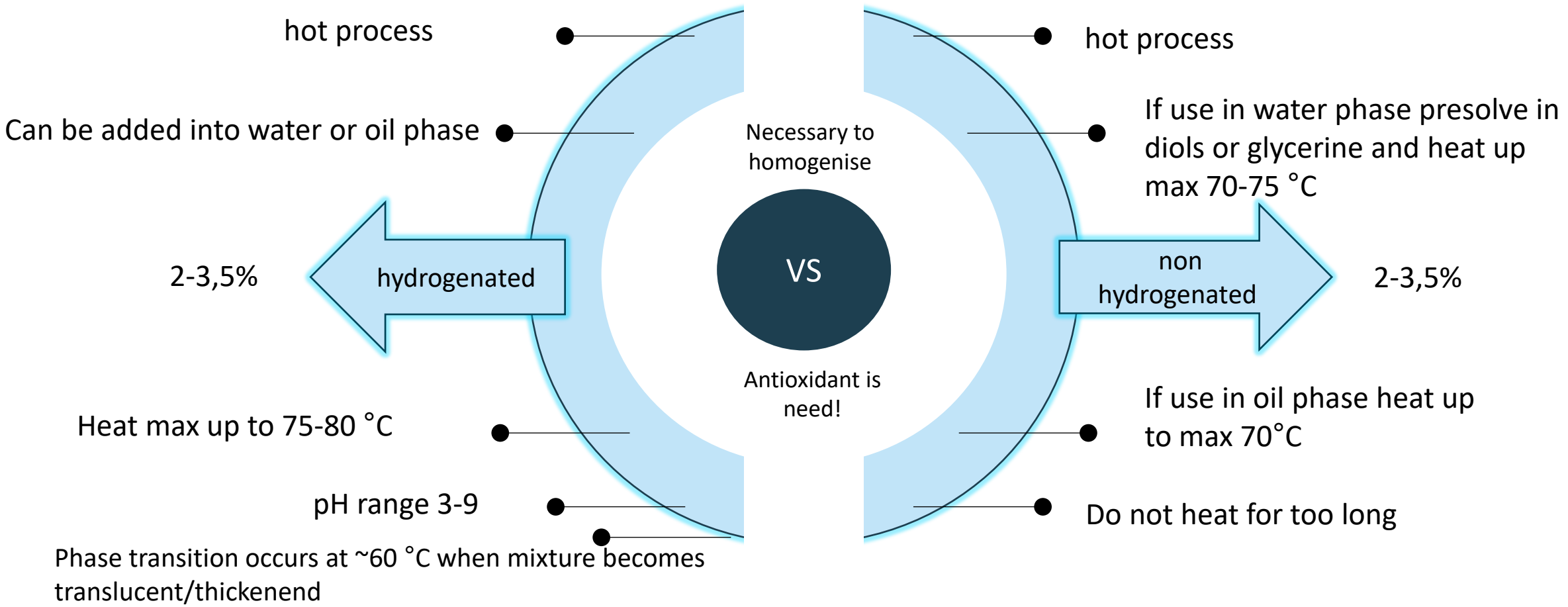

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Incorporation of BergaSom Sun 75H

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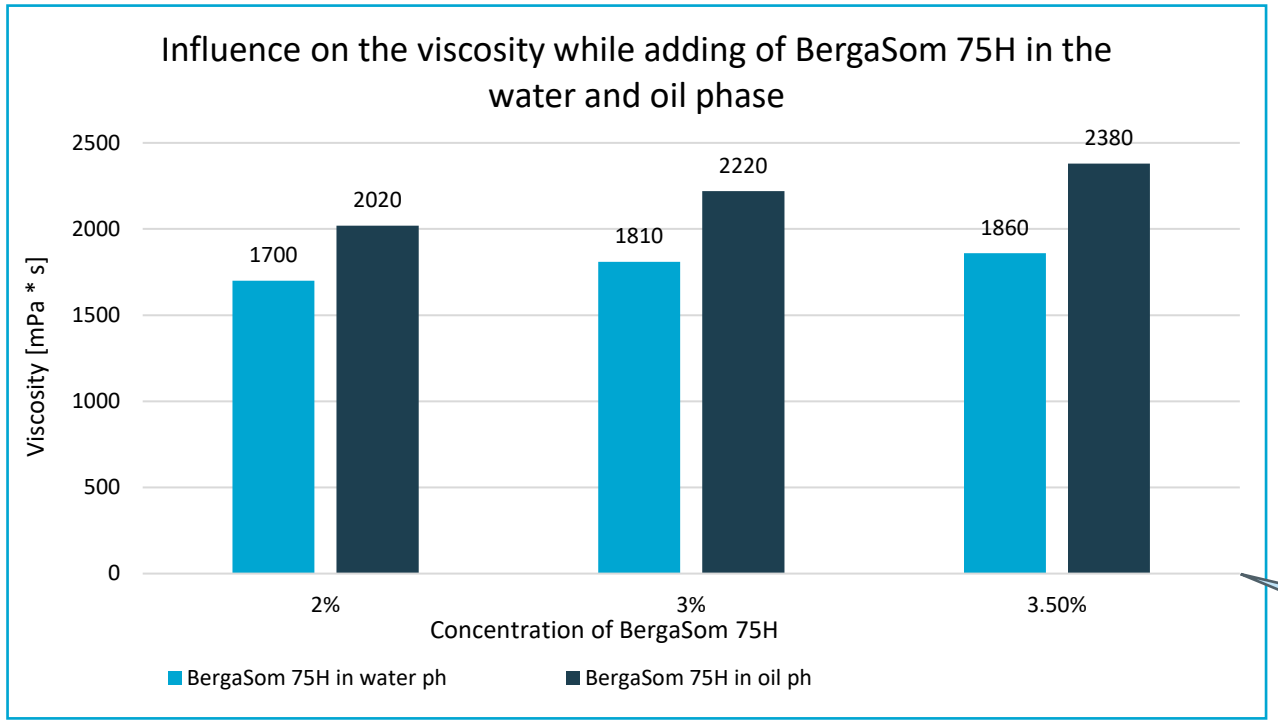
Technical aspects



Observations

- \+ BergaSom Sun 75H can be added into the water phase or into the oil phase.
- \+ By adding into the oil phase, the viscosity of the formulation could be a bit higher.

Only a hot process procedure!

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Usage Concentration of BergaSom Sun 75H

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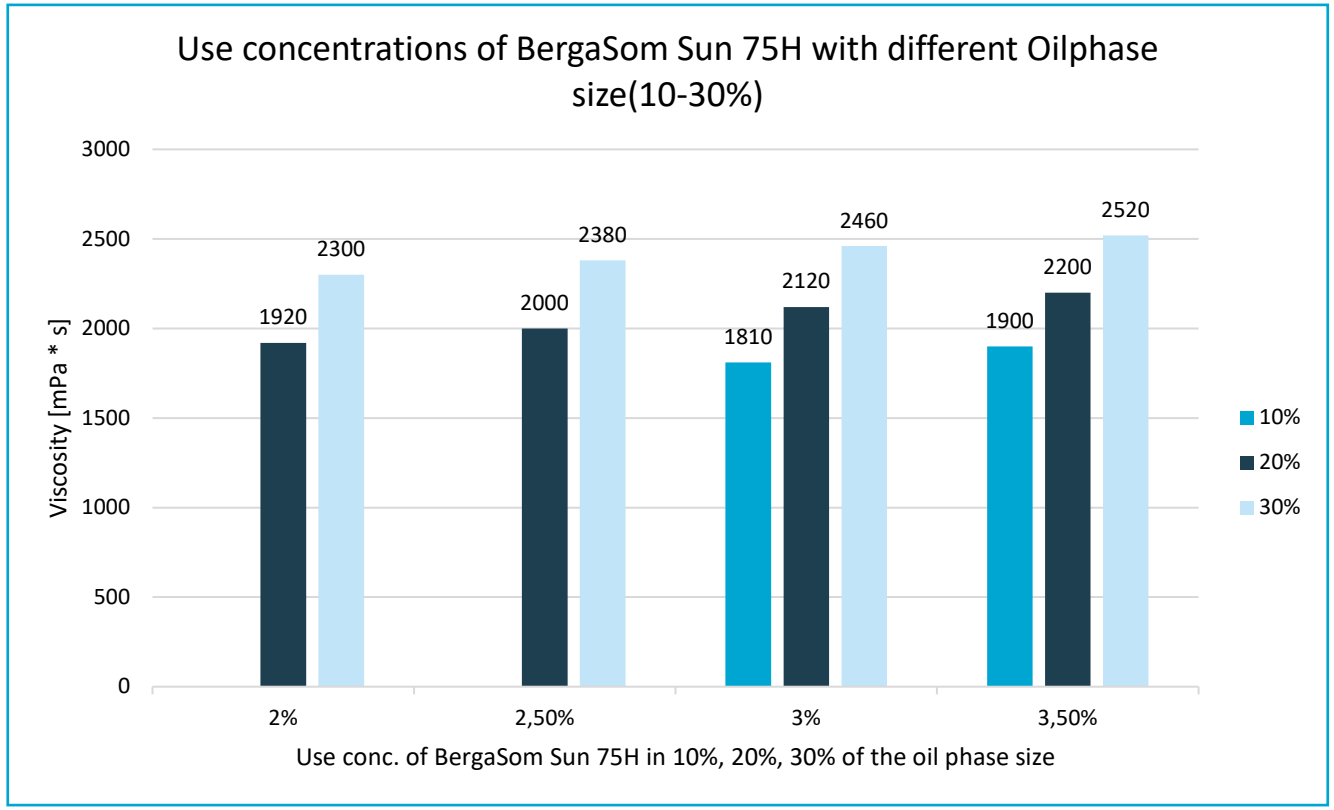
Technical aspects



10% oil phase:
3-3,5% of
BergaSom Sun 75H

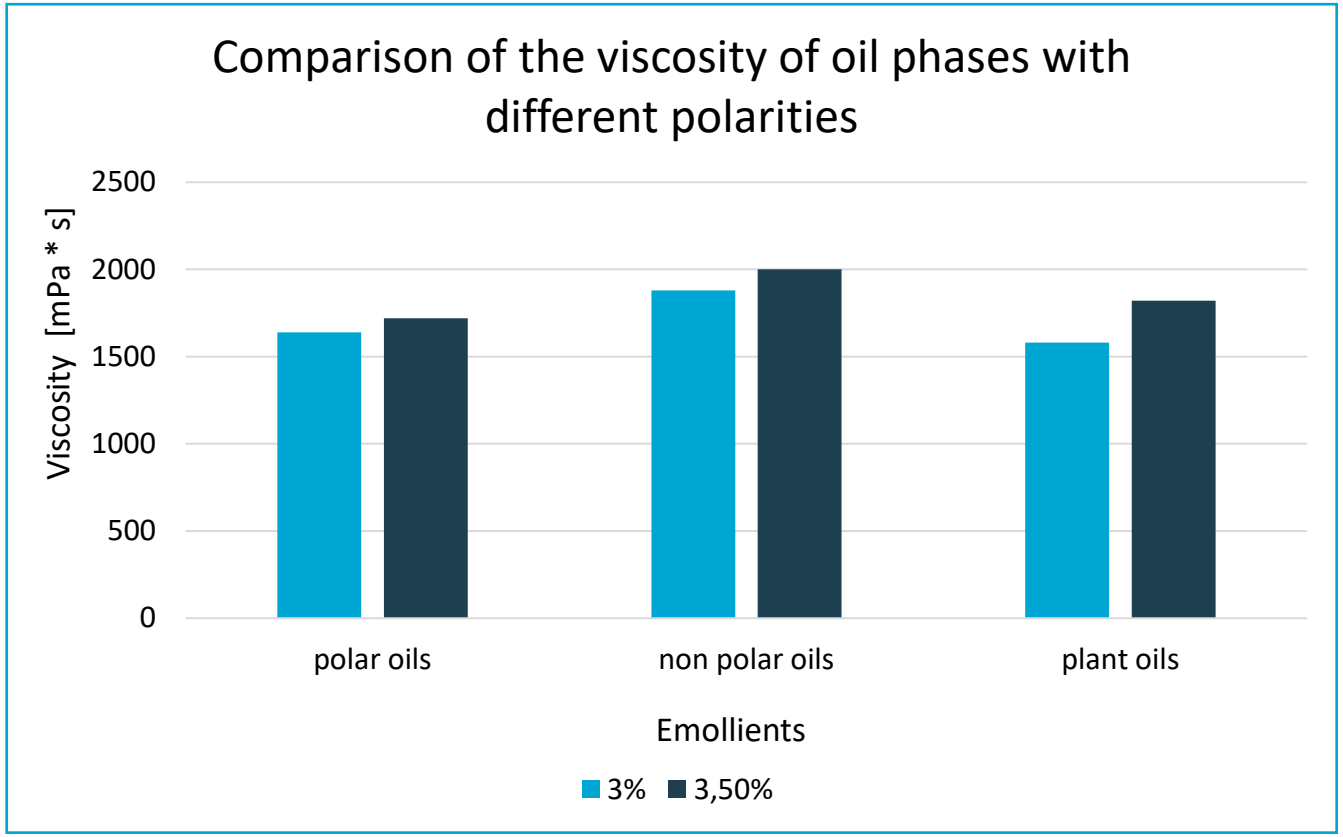
20% oil phase:
2-3,5% of
BergaSom Sun 75H

30% oil phase:
2-3,5% of
BergaSom Sun 75H

+ BergaSom Sun 75H builds no high viscosity alone without any FA or thicken agents

Compatibility with different oil polarities

Technical aspects- BergaSom H



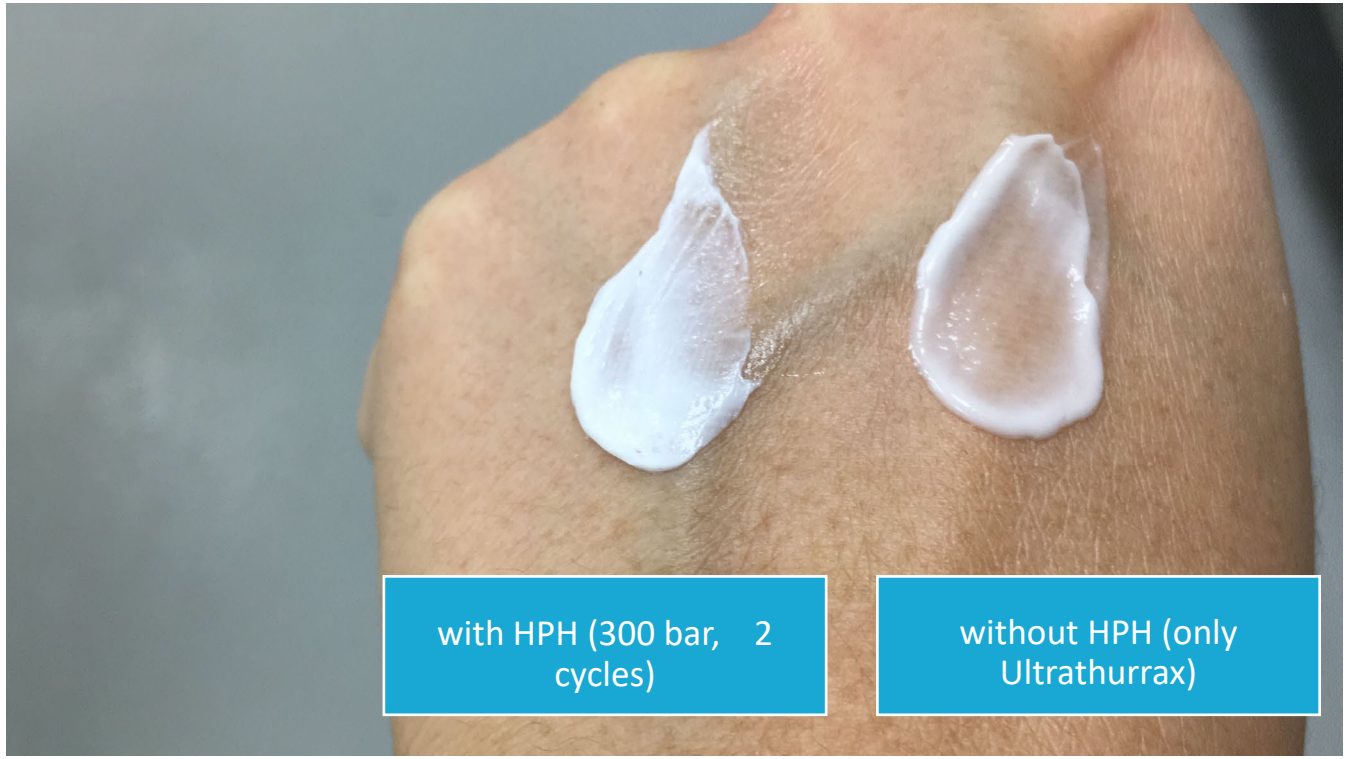
Observations

+ BergaSom Sun H is compatible with different types of the emollients.

Influence of production protocol

BergaSom Sun 75 H

Phase	Raw material	percentage
A	Water	Up to 100%
	BergaSom Sun 75H	3%
B	Cetearyl Alcohol	2%
	BergaBest MCT Oil 60/40 (Caprylic/Capric Triglyceride)	38%
	Pentaerythrityl Tetra-di-*t*-butyl Hydroxyhydrocinnamate (Antioxidant)	0.5%



HPH = high pressure homogenization, e.g. with Panda Plus 2000 (GEA Niro Soavi)

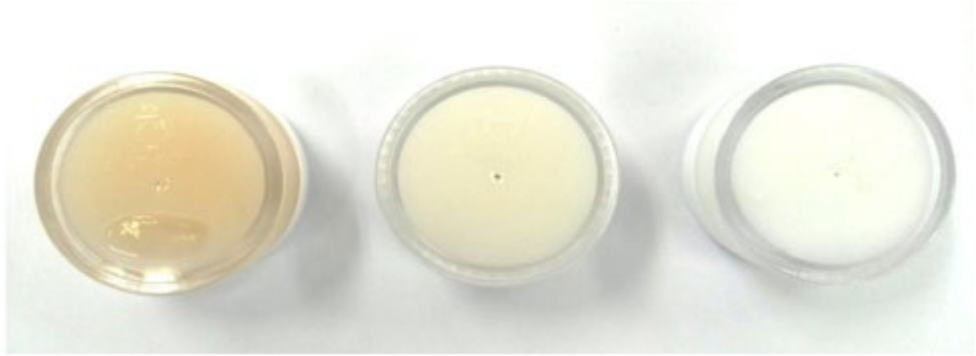
Competitor Overview

Colouration and odour

Ingredient	%
Water	83.5
1,3-Butylene Glycol	3.5
Glycerin	3.0
Lecithin	7.5
Ethanol	2.5

Method:
Add Lecithin, Glycerin, Butylene Glycol, Ethanol, Water into a bottle and mix together at 80°C (20min, 400rpm)

After everything is dissolved, cool down and chill sample.



Competitor A ("75" but~70% PC)

BergaSom Soy 75H (>70% PC)

BergaSom Soy 90H

- Colour is whiter
- No odour
- Emulsification is better
- Sensory is light

Summary

1. A variety of different substances can be found under the term “lecithin”.
2. For cosmetic use, specific phospholipid fractions like phosphatidylcholine are of biggest interest.
3. Phosphatidylcholine acts as active, functional or claim ingredient, depending on intended use.
4. Hydrogenated vs. non-hydrogenated types
5. 100% natural origin and COSMOS approved.



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Thank you!