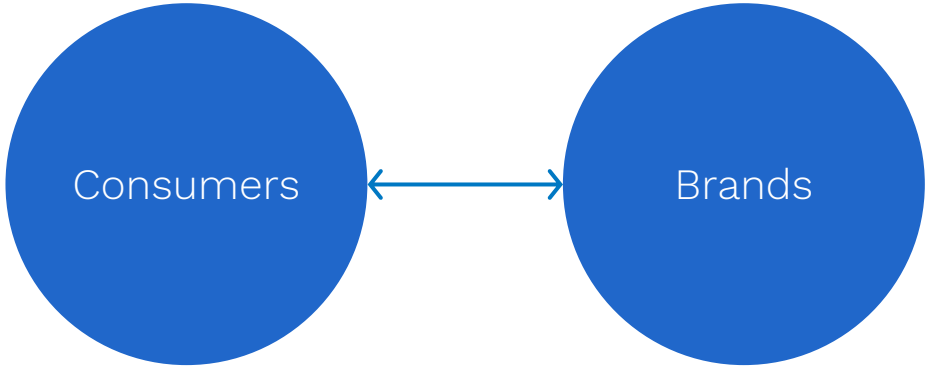
Our portfolio based on Swedish canola, a sustainable source for cosmetic ingredients

AAK Personal Care

Content

After Covid-19, the Personal Care market will recover but consumers expect more from brands

Expected growth rate between 2021-2024 in personal care



Safety
Transparency
Ethical sourcing
Social responsibility
Morally-aligned brands
Sustainable products that work

Source: Euromonitor reports, 2020

Sustainability continues to be on the consumer agenda. Covid-19 has increased its importance

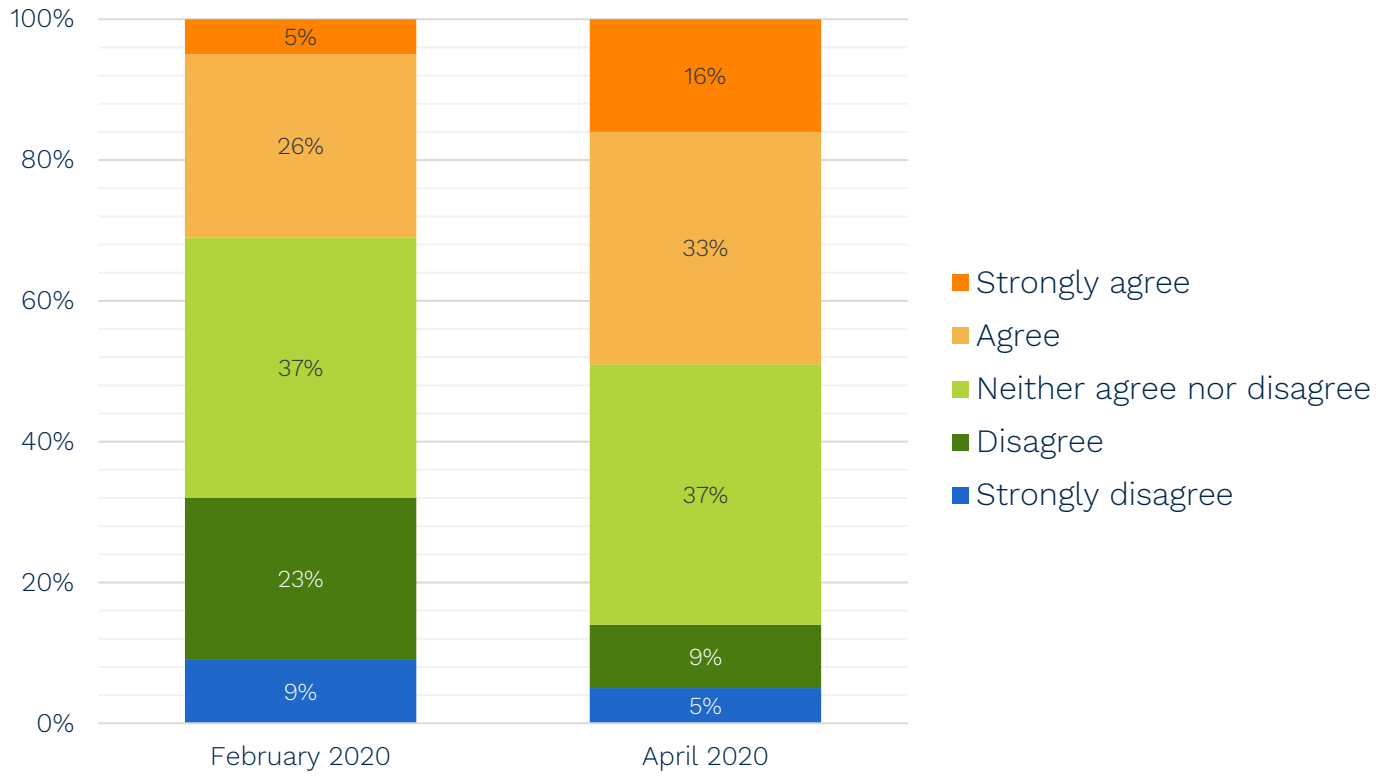
% who agree that they avoid personal care products which are harmful to the environment

France	Germany	Spain	UK
62%	58%	56%	50%

Source: Kantar studies. Worldpanel division, June 2020

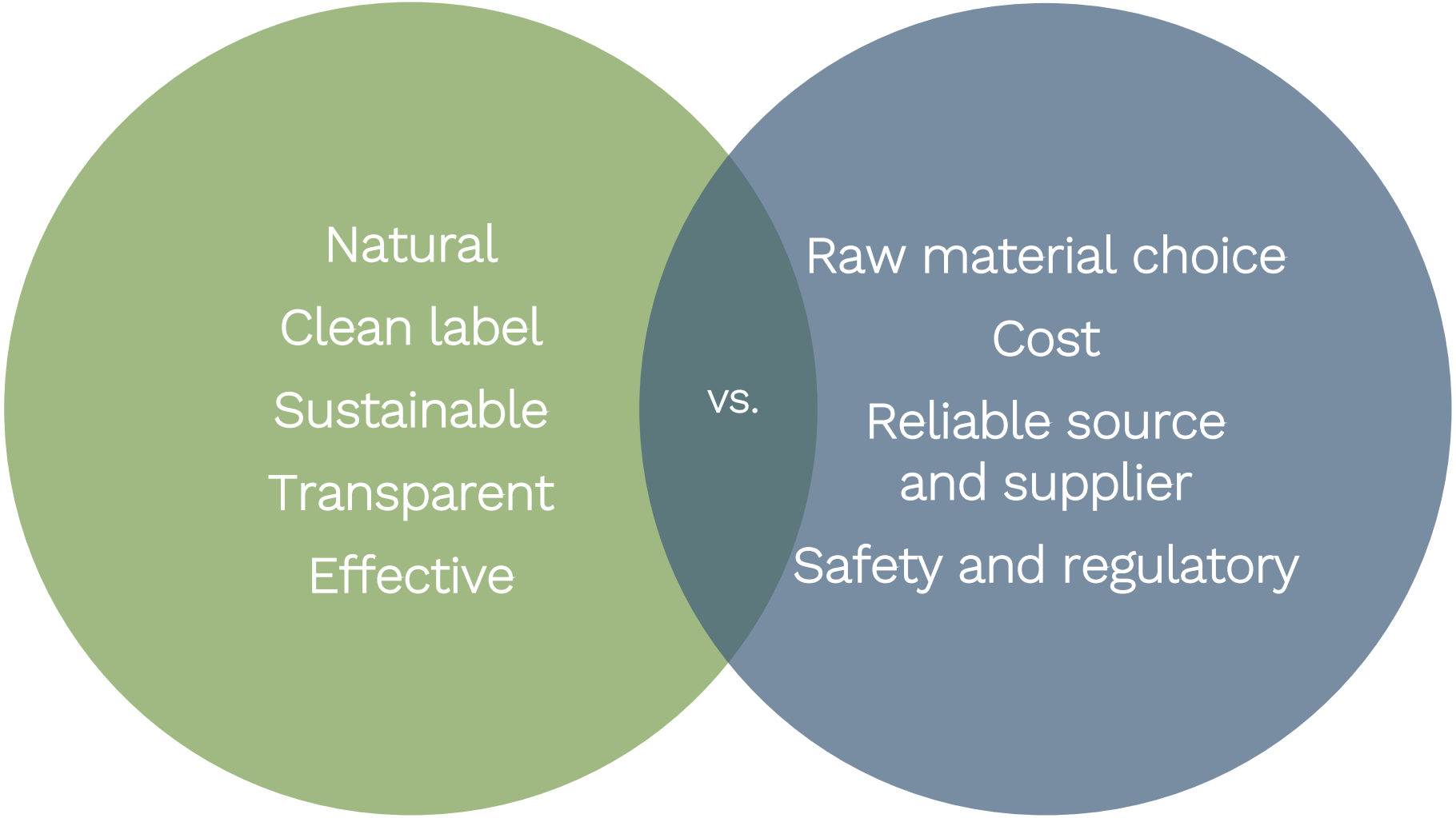
Sustainability continues to be on the consumer agenda. Covid-19 has increased its importance

“I prefer products and services that offer ways to offset their impact on the environment”



Source: Kantar studies. Kantar´s sustainability foundational study, February 2020

The dilemma for the cosmetic producer



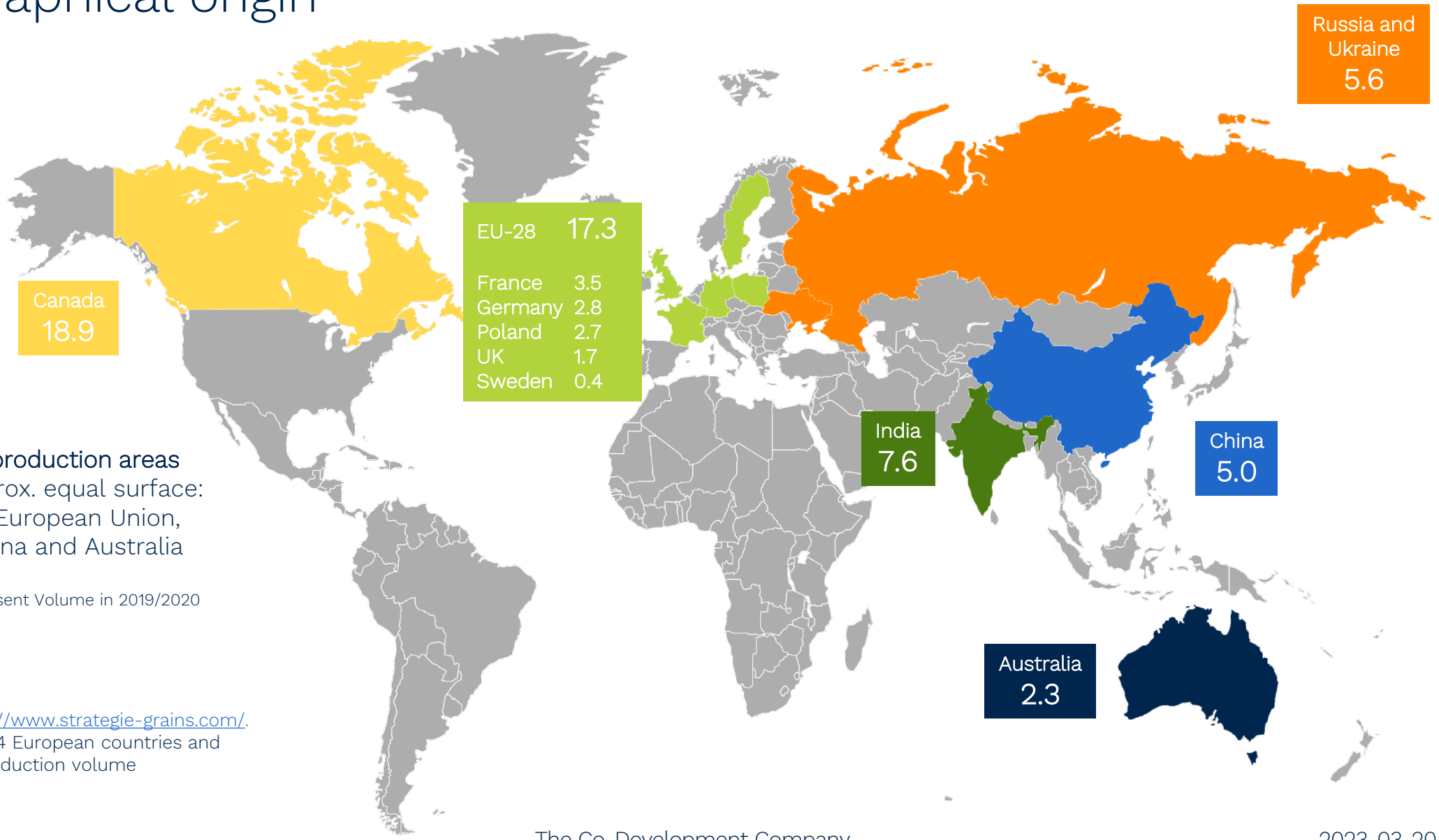
Have you considered canola emollients from AAK as an answer to this dilemma?

Canola originates from Canada but today is produced across the world

The term canola comes from Canadian Oil Low Acid and is a trade name for low erucic acid rapeseed oil. Originally cultivated in Canada in the early 1970s, this variety of rapeseed contains < 1% erucic acid (C22:1) in its fatty acid profile.

- Canola belongs to the Brassicaceae family and other members include varieties of cabbage, turnip, mustard and crambe.
- Botanical name: Brassica campestris / Brassica napus (numerous crosses between the species).

Geographical origin



5 major production areas with approx. equal surface: Canada, European Union, India, China and Australia

Values represent Volume in 2019/2020 in Mn/MT

Source: https://www.strategie-grains.com/. Selected Top 4 European countries and Sweden in production volume

AAK canola-based emollients are from non-GMO Swedish crops and traceable to farms – why is Sweden significant?

Swedish land has a **higher production yield** compared to other production regions outside Europe.

Yield for refined canola oil** (Kg/ha)

Sweden	Canada	Australia
3104	2211	1359

More than double yield compared to Australia and almost **50%** more than Canada

** Source: Agri-footprint database. Yield 2014-2018 from FAOSTAT

AAK

The Co-Development Company

AAK canola-based emollients are from non-GMO Swedish crops and traceable to farms – why is Sweden significant?

Within Europe, Swedish canola has a **much lower carbon** footprint than canola from other major European producers.

Carbon footprint* (Kg CO_2 eq per Kg of product)

Canola oil (SE)	**High Oleic Canola oil (SE)**	Canola oil (EU*)	High Oleic Canola oil (EU*)
1.40	**1.57**	2.34	2.85

Swedish Canola has up to **45% less carbon footprint** than canola from other major European producers, such as France and Germany.

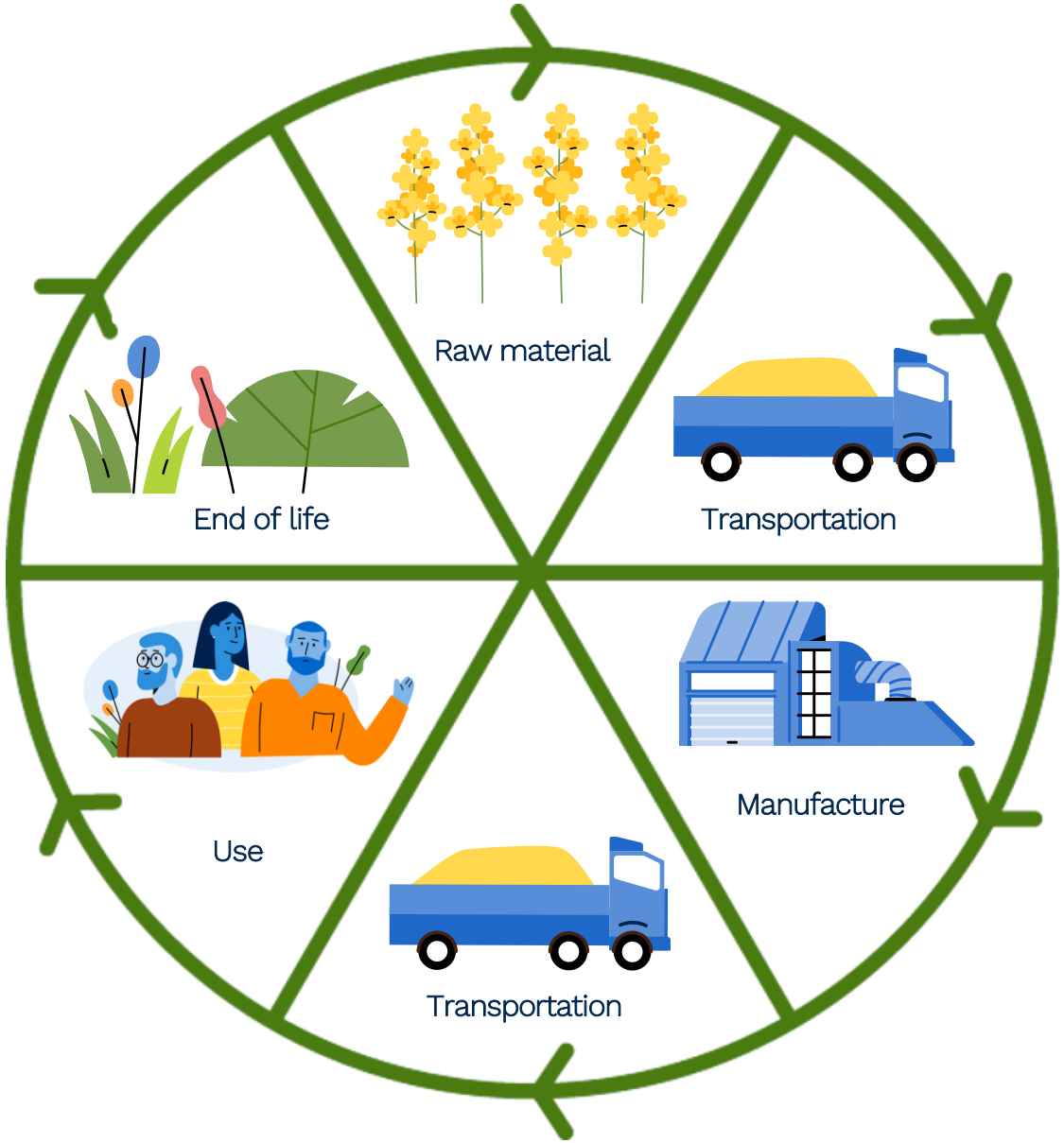
*Source: " Update of LCAs on vegetable oils at AAK". February 2016. RISE report. EU is an average of French and German data (top 2 producing European countries)

AAK

The Co-Development Company

Background to the LCA study done for AAK

Life cycle assessment is a cradle-to-grave or cradle-to-cradle analysis technique to assess environmental impacts associated with all the stages of a product's life, from raw material extraction through to materials processing, manufacture, distribution and use.



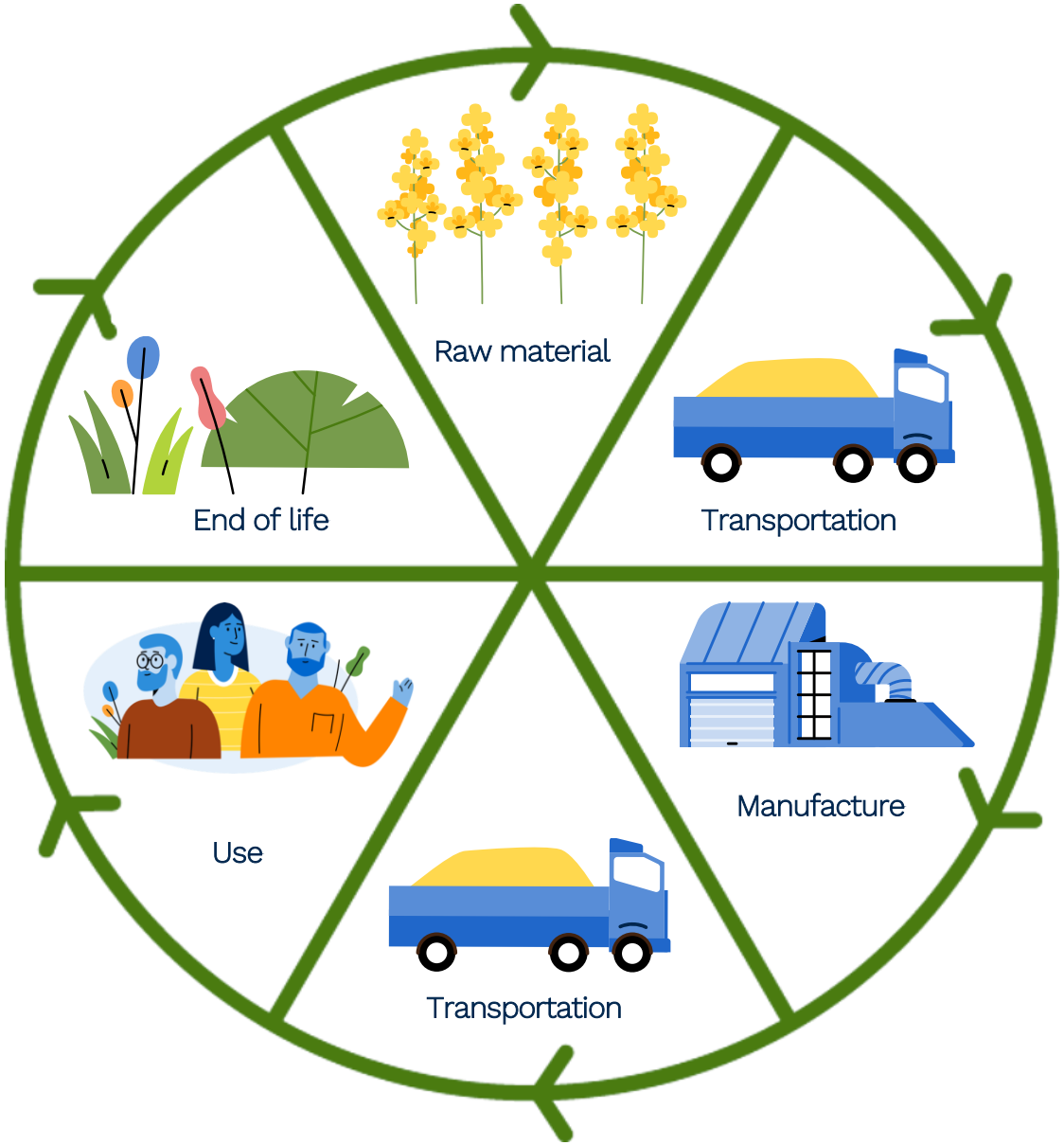
Background to the LCA study done for AAK

Goal To provide environmental information on three different canola oils from Swedish, Australian and Canadian origin being consumed in the US. The analysis provides information about the environmental impact from oil seed cultivation, oil processing and transport to and within the US.

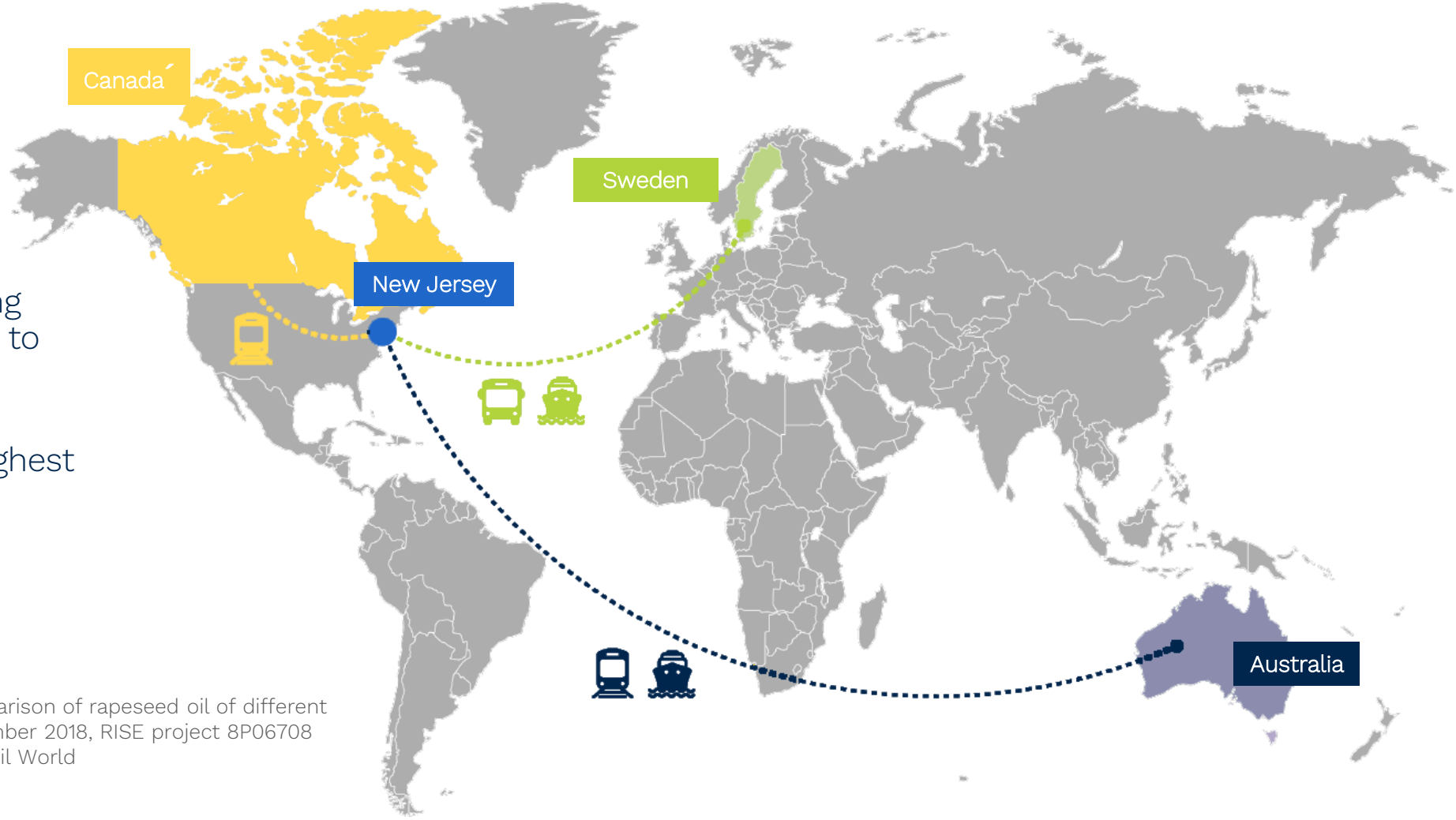
Scope The assessment includes impacts from: cultivation of the oil seed or fruits, oil processing, production and transport to and from a company in New Jersey, US. In the analysis the production and use of all consumables and inputs in all steps are included. For instance, production and use of mineral fertilizer during cultivation and chemicals used in the oil processing steps. All transportation in the value chain is included.

Type of LCA / Methodology The life cycle assessment performed is a comparative LCA. The study is conducted according to the ISO standard 14 040.

Functional unit The functional unit selected is 1 kg of refined canola oil delivered to Vineland, New Jersey, US.



AAK ran an LCA study to understand fully the environmental impact of our canola-based emollients vs. other origins



Scope covers sourcing from 3 supply chains to New Jersey (US).*

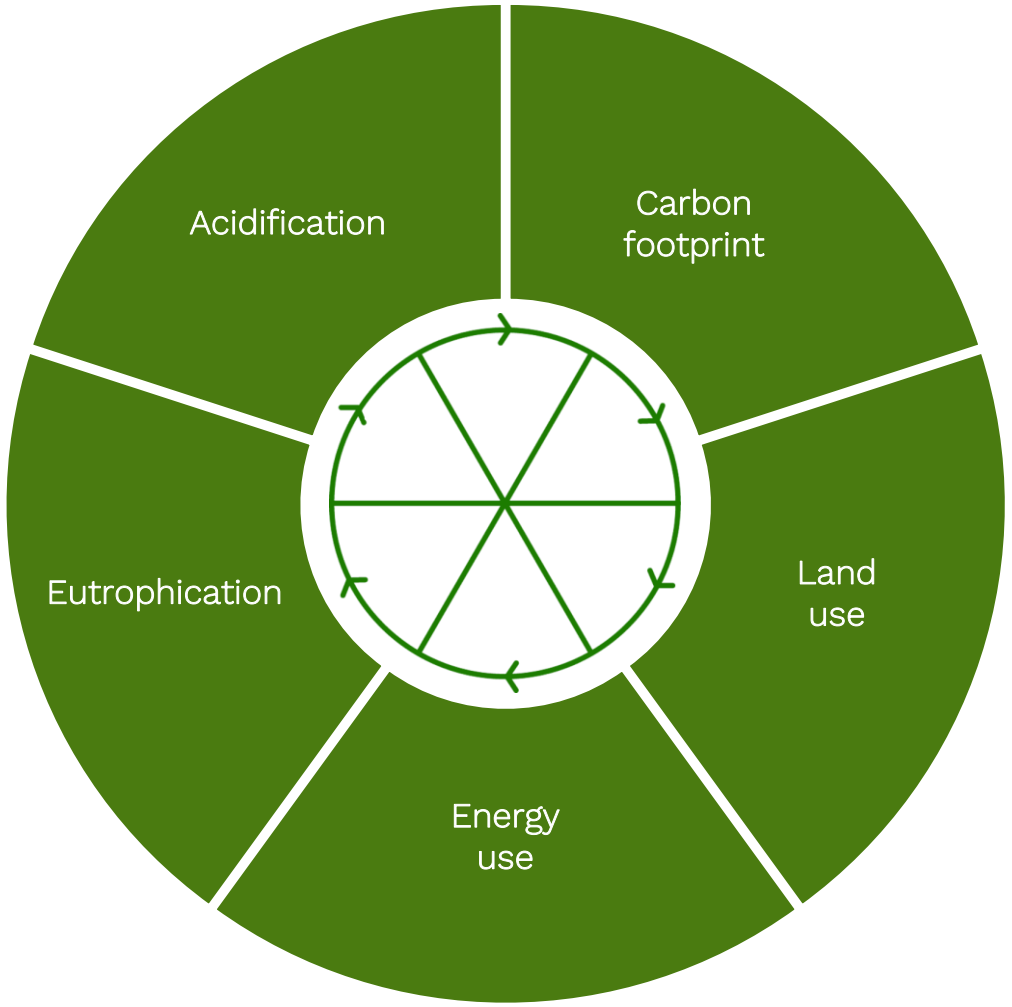
The US is one of the countries with the highest amount of import of canola oil.**

*Source: “Environmental comparison of rapeseed oil of different origin for use in the US”, November 2018, RISE project 8P06708
**Source: ISTA Mielke GBMH, Oil World

AAK ran an LCA study to understand fully the environmental impact of our canola-based emollients vs. other origins

Impact categories included*

Functional unit: 1Kg of refined canola oil

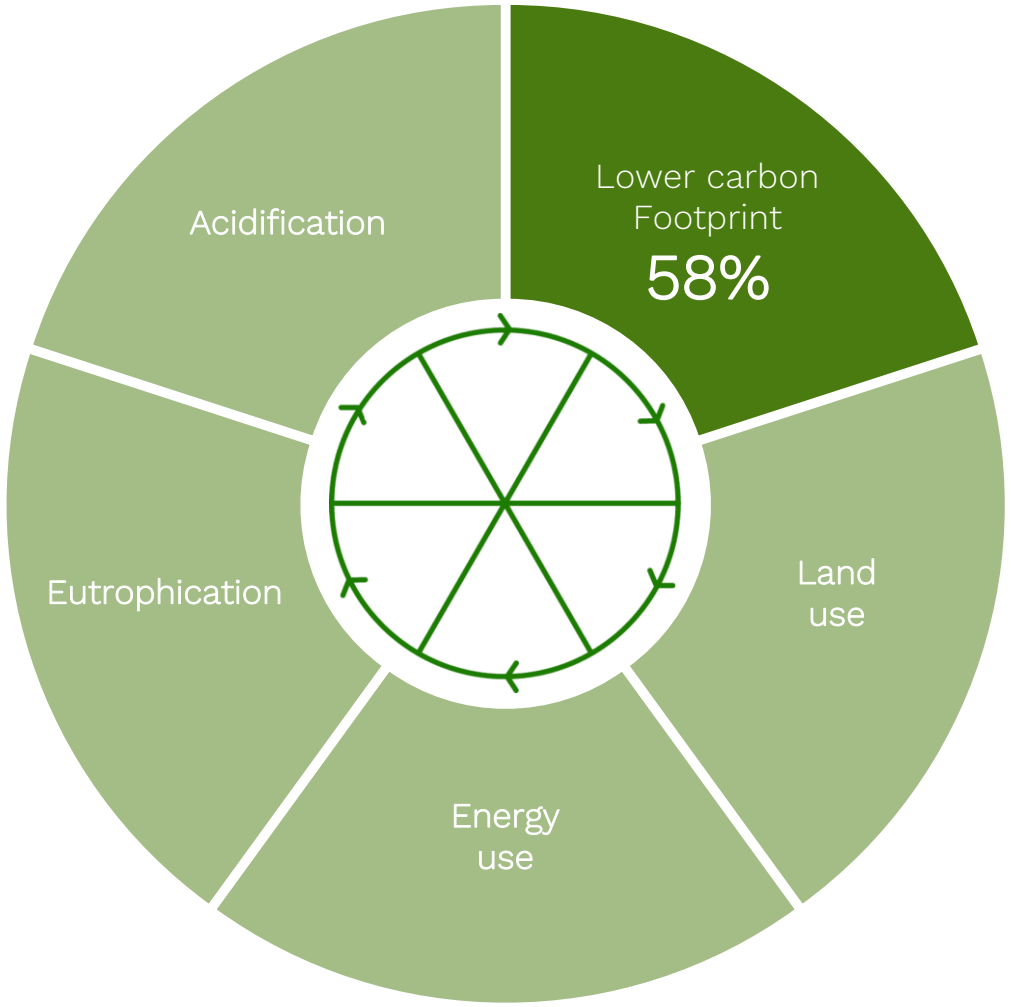


*Source: “Environmental comparison of rapeseed oil of different origin for use in the US”, November 2018, RISE project 8P06708

Our AAK canola-based emollients from Sweden are the most environmentally friendly choice

The LCA shows that AAK canola originating from Sweden:

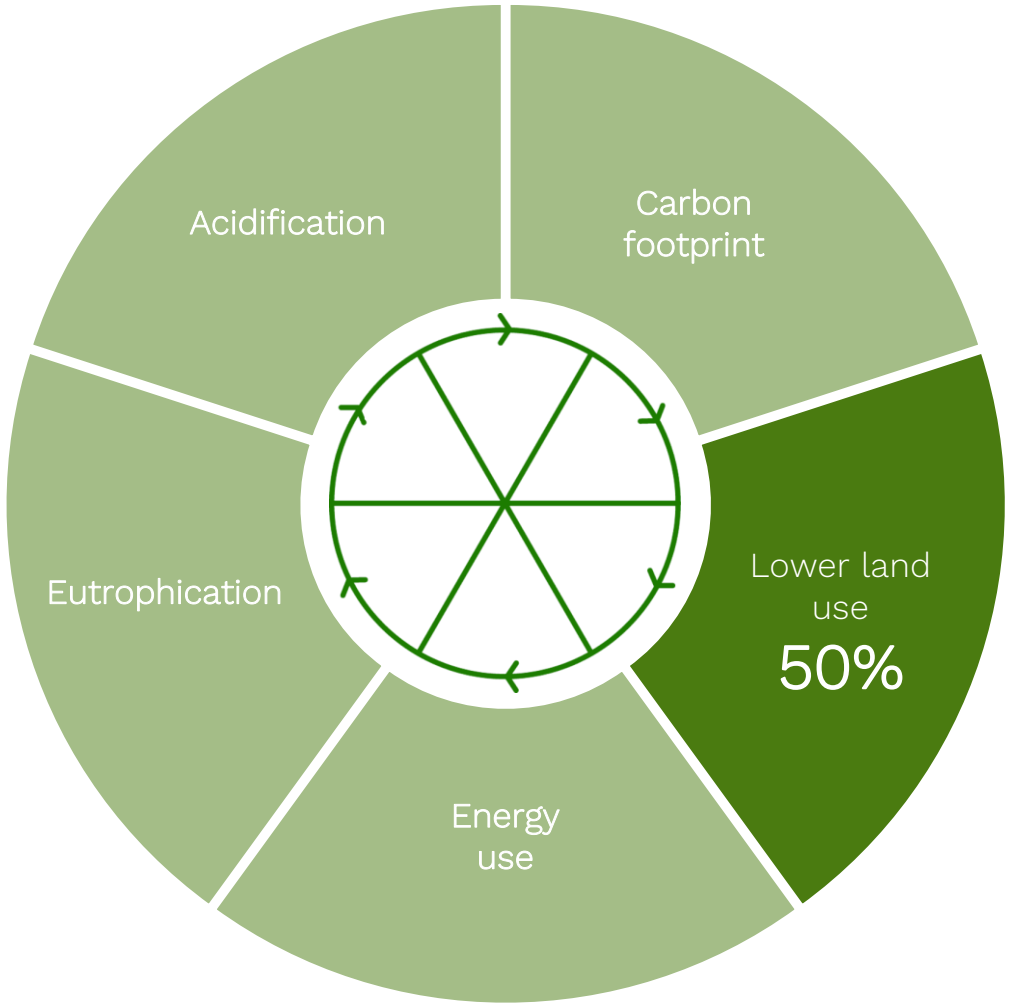
Has a **58%** lower carbon footprint compared to Canadian origin and much less than Australian origin (almost 7x less) regardless of the type of transportation and the distance.



Our AAK canola-based emollients from Sweden are the most environmentally friendly choice

The LCA shows that AAK canola originating from Sweden:

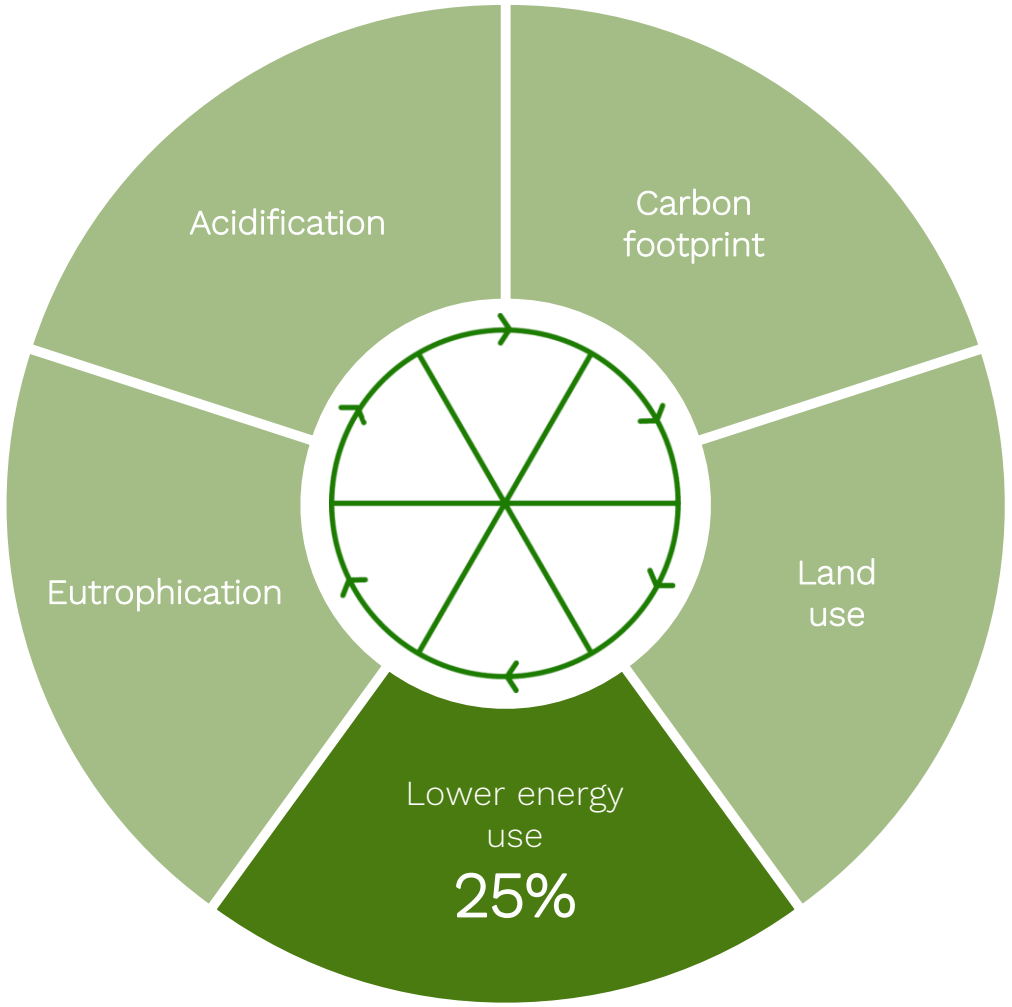
Uses half the land compared to Canadian origin and **65%** less compared to Australian origin to produce the same amount of canola.



Our AAK canola-based emollients from Sweden are the most environmentally friendly choice

The LCA shows that AAK canola originating from Sweden:

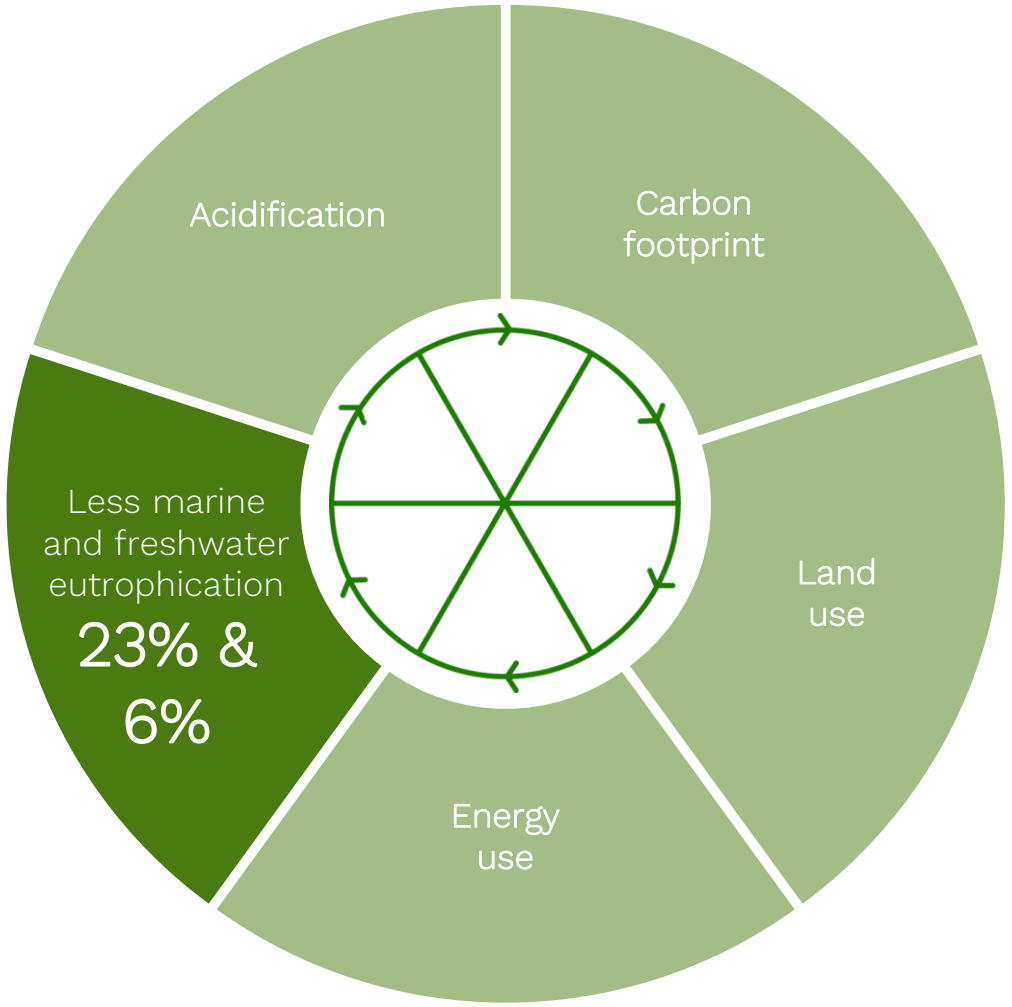
Uses **25% less energy** compared to Canadian origin and **45% less** compared to Australian origin due to the high percentage of renewable energy used in AAK´s factory.



Our AAK canola-based emollients from Sweden are the most environmentally friendly choice

The LCA shows that AAK canola originating from Sweden:

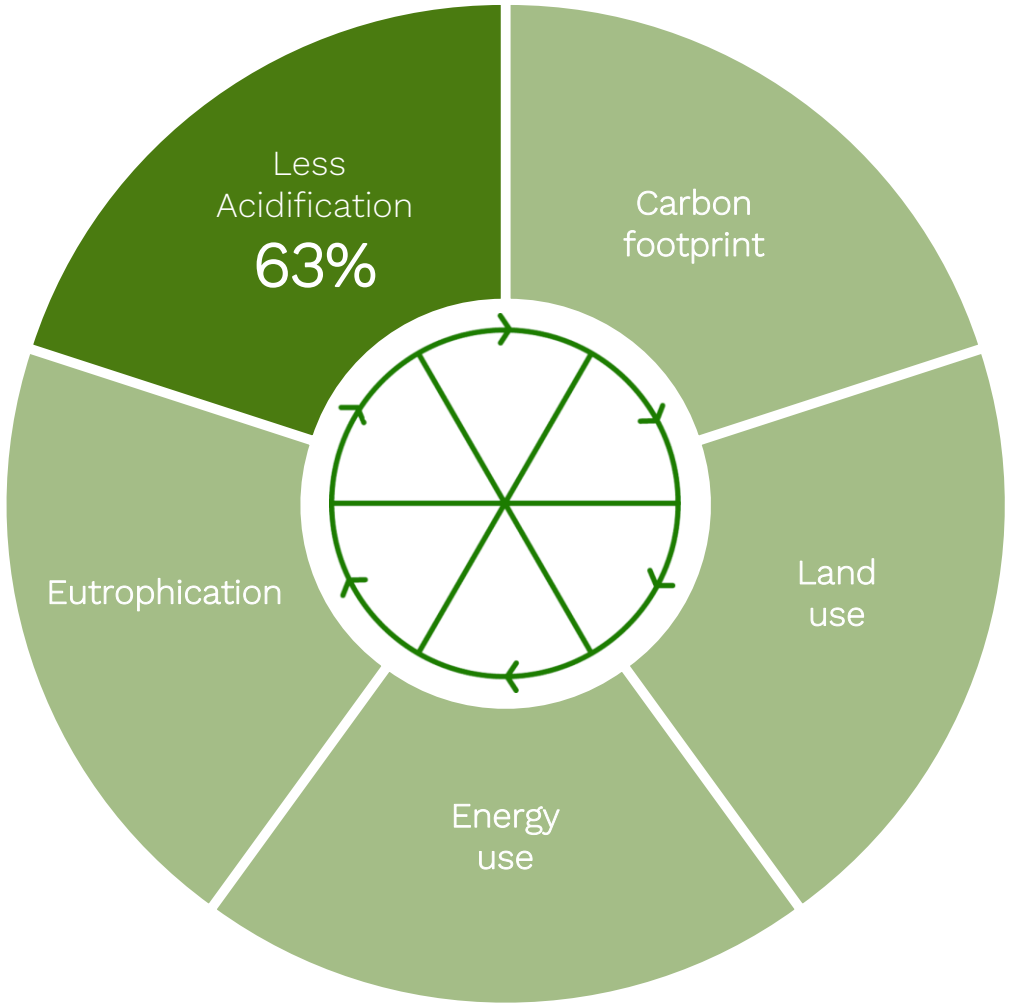
Shows **23% less marine water eutrophication** and **6% less freshwater eutrophication** compared to Canadian origin and significantly less than Australian origin (**43%** and **69%** respectively).



Our AAK canola-based emollients from Sweden are the most environmentally friendly choice

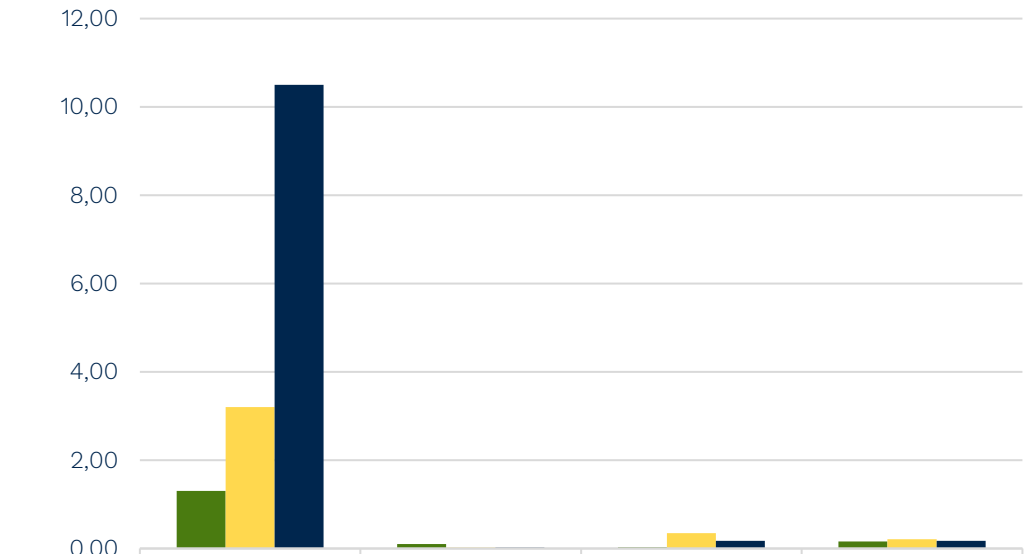
The LCA shows that AAK canola originating from Sweden:

Shows **63% less acidification** compared to Canadian origin and **73% less** than Australian origin.



The LCA shows that the largest part of the environmental footprint comes from cultivation and not transportation

GHG Emissions
Kg CO2 eq / Kg Canola oil



	Cultivation	Transport to processing	Processing	Transport to NJ
SE, AAK	1,30	0,10	0,03	0,16
Canada	3,20	0,02	0,35	0,21
Australia	10,50	0,02	0,17	0,17

*AAK supply chain from Sweden score best in all the impact categories of the LCA

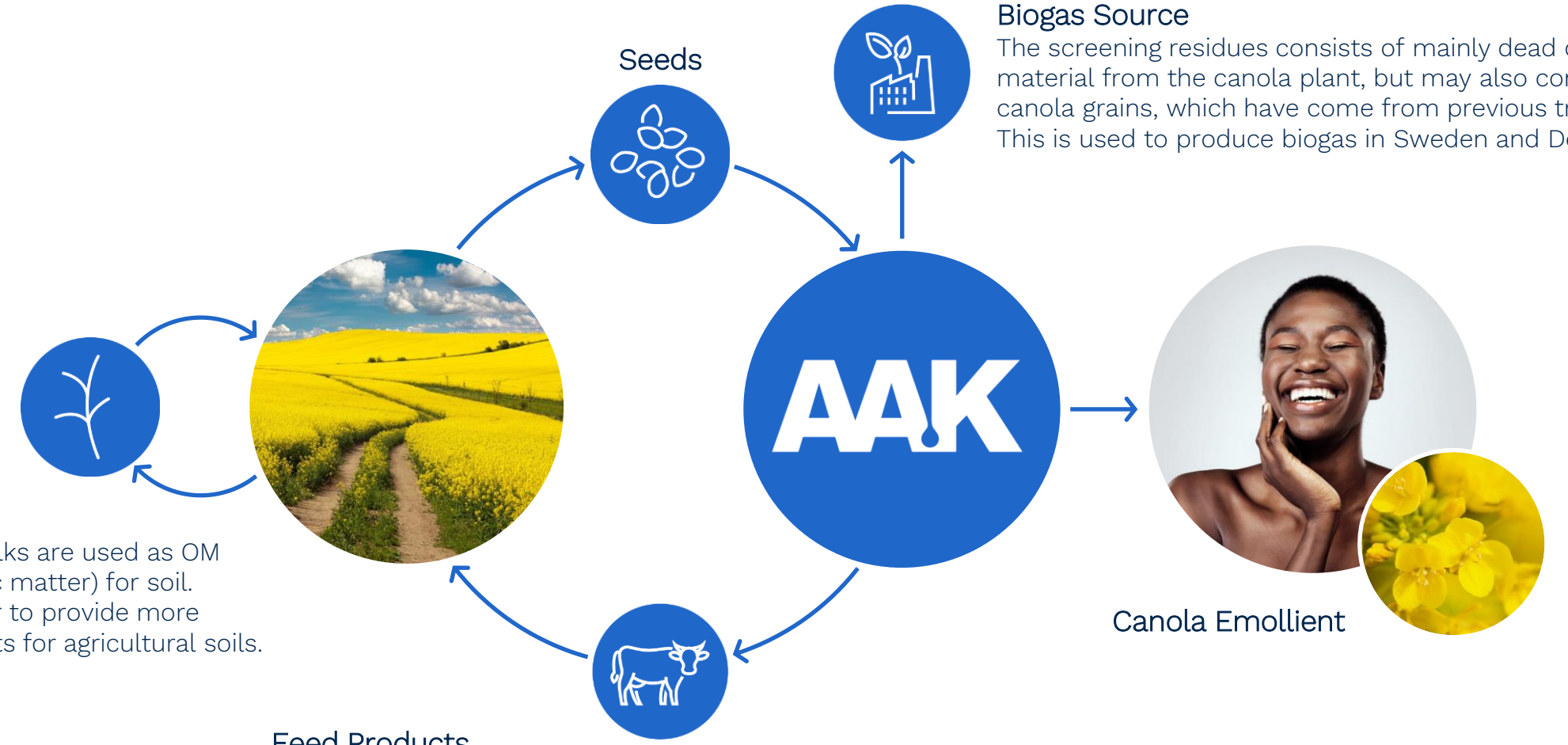
80-95%
GHG emissions are from cultivation

Cultivation is the main step when it comes to canola footprint

Key reasons: type and amount of fertilizer relative to the yield per hectare for that region

Our AAK supply chain from Sweden is the most environmentally friendly one*

… and at AAK our canola supply chain is Zero-waste



On-pack consumer claims for canola

1. Vegan-friendly

2. Swedish origin
   (Nb: If preferred, Nordic or Scandinavian can be used as an alternative description to Swedish. However, the Nordic region consists of Denmark, Norway, Sweden, Finland, and Iceland, as well as the Faroe Islands, Greenland, and Åland. And Scandinavia is geographically considered to be Denmark, Sweden, and Norway. So, either term dilutes the traceability message and only has Swedish claims to support it.

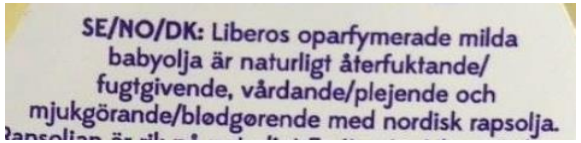
3. **Primary claim:** Eco-friendly or Eco-conscious or Environmentally friendly
   Secondary claims: zero waste
   low carbon footprint

4. Sustainably sourced

5. Clean beauty

Canola Consumer Claim	Definition	Verified by
Vegan-friendly	Does not contain any animal or animal-derived ingredients, nor has it been tested on animals.	A signed AAK statement confirms there is no risk for cross-contamination of animal material, and no animal testing has been performed. Based on this, we consider all products within our canola range suitable for vegan
Swedish origin	All the canola oil is traceable to Swedish farms, and we know in which regions the crops are grown. However, we cannot trace batches to individual farms, so it is not an identity-preserved segregation model.	We monitor traceability through supplier engagement and segregated raw material flows. All AAK suppliers must sign up and adhere to the AAK Policy and Code of Conduct for Responsible Sourcing of Vegetable Oils, covering traceability, biodiversity and human rights. In addition, we use certification schemes like ISCC (EU/Plus) to drive compliance. ISCC (EU/Plus) aligns with the Sustainable Agricultural Initiative (SAI) Silver level, providing traceability along the supply chain and verifying that companies meet environmental and social standards.
		ISCC
		Sustainable Agricultural Initiative (SAI)
Primary claim: Eco-friendly or Eco-conscious or Environmentally friendly	Farmed and produced in a way that considers and minimizes the environmental impacts throughout the life cycle.	AAK uses Life Cycle Assessment to measure the environmental impacts of its Swedish canola supply chain, including carbon footprint, land and energy use, eutrophication and acidification. The outcome shows that Swedish cultivation methods, agricultural practices, and favorable climate result in a lower carbon footprint than French, German, Canadian and Australian sources and a significantly higher yield than the non-European crops. In addition, Swedish canola performed well against comparative crops on all measured parameters. Details of the LCA are available on request.
Secondary claim: zero waste	*The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health.*	AAK operates a zero-waste canola supply chain. Farmers repurpose discarded stalks as fertilizer. After processing, AAK converts the solid part of the seed into animal feed and sells screening residues from production for biogas, an environmentally friendly renewable energy source. In the broadest terms, there is a degree of circularity within the supply chain's farming system in that waste ends up as fertilizer on Swedish farmers' fields and as food for their livestock. But this is only a part of the supply chain, and waste material does not return to the farm of origin. So a zero-waste supply chain is the only correct definition to use for claims.
Secondary claim: Low carbon footprint	*A low carbon footprint reduces direct and indirect greenhouse gas (GHG) emissions associated with all product life cycle activities.*	*Life Cycle Assessment shows that Swedish cultivation methods, agricultural practices, and favourable climate result in a lower carbon footprint than French, German, Canadian and Australian sources.*
Sustainably sourced	Sourced from a supply chain that recognizes the social and environmental impact of its activities, and takes action to prioritize and mitigate risks.	Good agricultural practices within the Swedish farming system, supported by robust legal frameworks and environmental incentive schemes, help mitigate sustainability concerns related to canola. Life Cycle Assessment confirms that Swedish canola is more environmentally friendly and has a lower carbon footprint than canola crops from other countries, namely France, Germany, Canada and Australia.
		In addition, all AAK suppliers must sign up and adhere to the AAK Policy and Code of Conduct for Responsible Sourcing of Vegetable Oils, including traceability, biodiversity and human rights aspects. We use certification schemes like ISCC (EU/Plus) to drive compliance. ISCC (EU/Plus) aligns with the Sustainable Agricultural Initiative (SAI) Silver level, providing traceability along the supply chain and verifying that companies meet environmental
Clean beauty	Non-toxic ingredients and final cosmetic formulations safe for people and the planet.	Safety Data Sheets cover all our canola-based personal care ingredients. These are issued following Commission Regulation (EU) 2020/878 of 18 June 2020, amending Regulation (EC) No 1907/2006 of the European Parliament and the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).
		An additional document certifies that our canola supplies are of non-GMO origin and in compliance with Regulation (EC) No 1829/2003 and Regulation (EC) No 1830/2003, including amendments.
		Verification for environmental safety is covered under the Life Cycle Assessment and the ISCC (EU/Plus) certification. And we consider all our canola-based ingredients suitable for clean beauty formulations.

Get inspired by the natural Nordic trend without compromising the environment



Market: Finland
Launch: January 2020
Back of pack: “Liberos perfume-free mild baby oil is naturally moisturizing, hydrating and caring with Nordic canola”

Market: Denmark
Launch: January 2021

Market: Lithuania
Launch: January 2021

Source: Mintel, GNPD database

Penaten Nature-soft Range – highlighting canola/rapeseed

Apolosophy Active – highlighting skin care benefits of canola oil

Apolosophy Active+ Vitamin E

(tocopheryl acetate + tocopherol 8%)

A serum with two variants of the antioxidant vitamin E; tocopheryl acetate and tocopherol. Vitamin E strengthens the epidermis (top skin), soothes stressed skin and helps to slow down premature aging of the skin. Canola oil has softening and repairing properties and increases elasticity in the skin.

- ✔ Prevents premature aging
- ✔ Protects against free radicals and strengthens the skin barrier
- ✔ Suitable for prematurely aging skin

Other examples highlighting canola on pack or in the blurb

The Arctic Hydra Care Moisture & Relief Rich Day Cream helps revitalise & comfort dehydrated or skin prone to extreme dryness. This formula contains soothing Nordic bilberry, oat and canola oils combined with a moisture-locking Beta complex helps restore skin's moisture levels for a lasting and intense re-hydration, and relief from feeling of tightness. It provides thermal stress-protection against dehydration caused by temperature changes to reduce the appearance of dryness-induced redness. Suitable for dry and sensitive skin. Fragrance-free.

The canola oil used in our emollient portfolio is traceable to farms in Sweden

LIPEX® PreAct™
Bioactive emollient rich in phytosterols and tocopherols

LIPEX® Cellect™
Bioactive concentrate of phytosterol esters

LIPEX® Bassol C™
Clear and odorless high stability base emollient

High Oleic Brassica Oil™
Oxidation stable oil with high oleic acid content

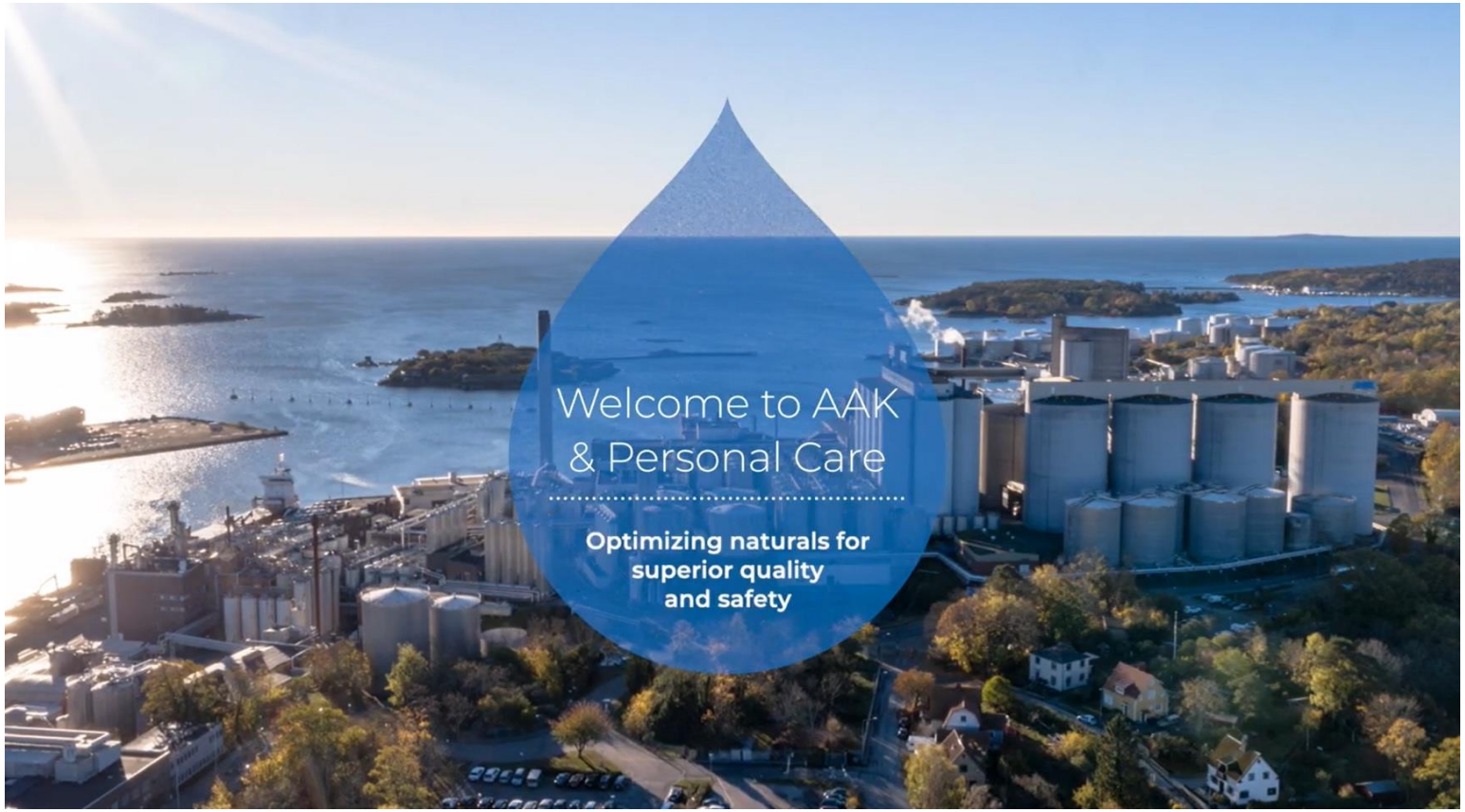
LIPEX® 120
Antioxidant stabilized oil

Akofine R™ *
Structurizing and stabilizing triglyceride

CANOLA SEEDS*

Watch the following video to learn more about our AAK transformation process from raw material to a pure, refined canola oil

For a seamless full-screen transition to video when presenting in PowerPoint, download the original video from the AAK PC portal to your PC. It can also be streamed from AAK PC Youtube Channel here.



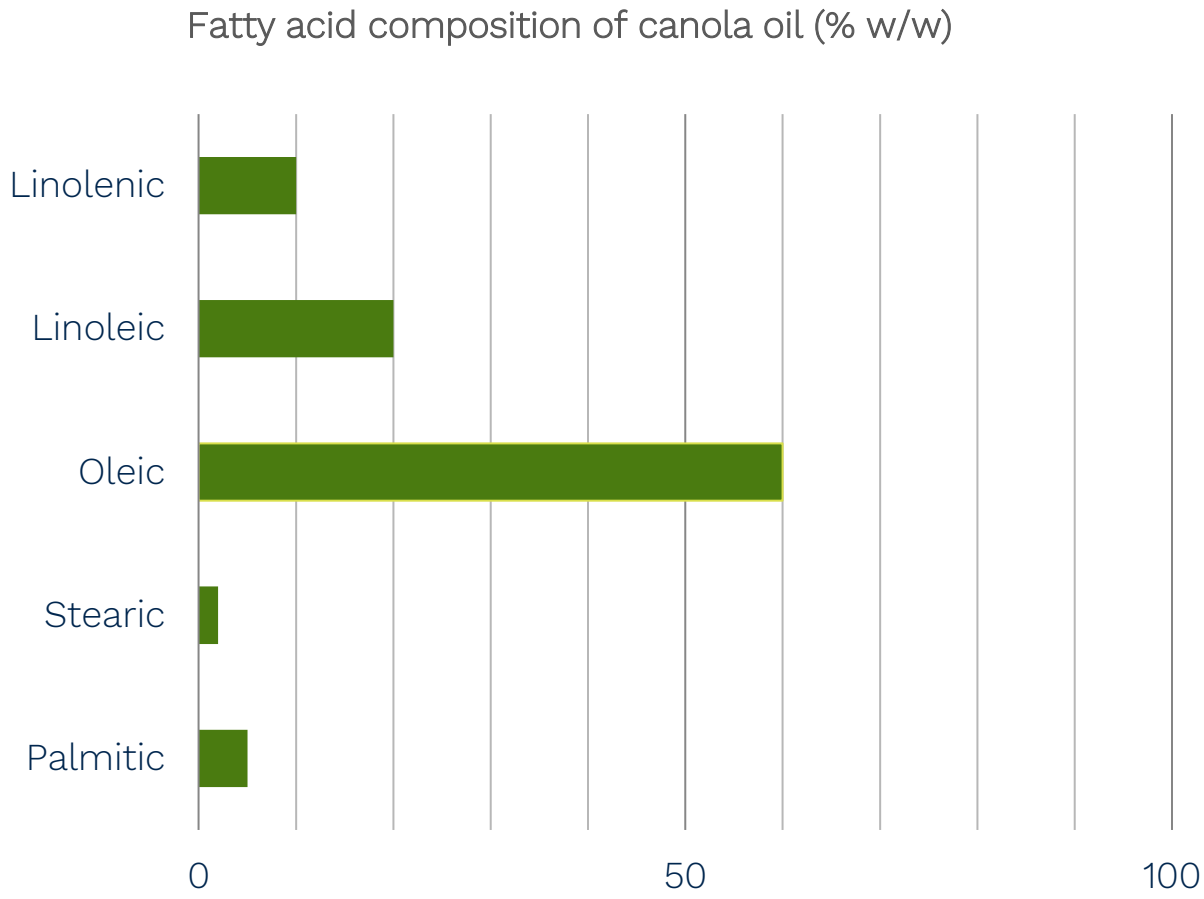
Our products derived from Swedish canola

Canola – a rich source of functional lipids

Lipid class	Skin care functionality
Triglycerides	Moisturization and barrier function
Fatty acids	Building blocks of healthy cell membranes and play a role in the formation of the skin's natural oil barrier; precursors of bioactive mediators
Phytosterols	Anti-inflammatory agents and essential constituents of cell membranes
Tocopherols	Anti-oxidants and anti-inflammatory agents

Canola fact file

- Small black to brown seeds with around 40% oil content
- Triglycerides dominated by oleic, linoleic and linolenic acids, low saturated content
- Unsaponifiables dominated by tocopherols and phytosterols
- AAK applies processing to improve quality and stability, and tailor-make properties for personal care



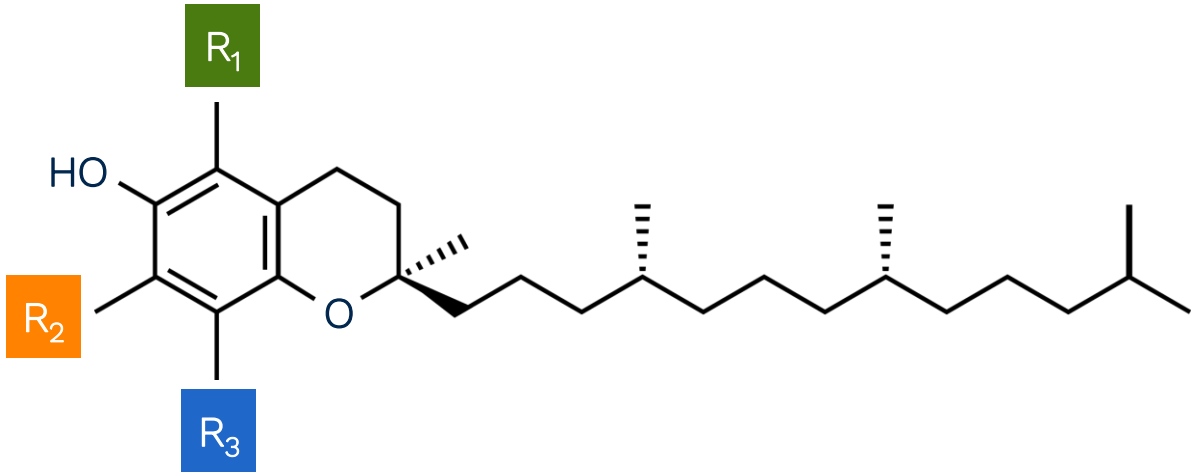
Tocopherol composition of canola oil

Total tocopherols: 400–2700 mg/kg

- Alpha-tocopherol: 35%
- Gamma tocopherol: 64%
- Delta-tocopherol: 1%

- Tocopherol content depends on quality, age and processing of the oil
- Oil that is naturally rich in tocopherols is better protected against oxidation.

Tocopherol structure



Form	R1	R2	R3
Alpha	Me	Me	Me
Beta	Me	H	Me
Gamma	H	Me	Me
Delta	H	H	Me

H: Hydrogen, Me: Methyl (CH3)

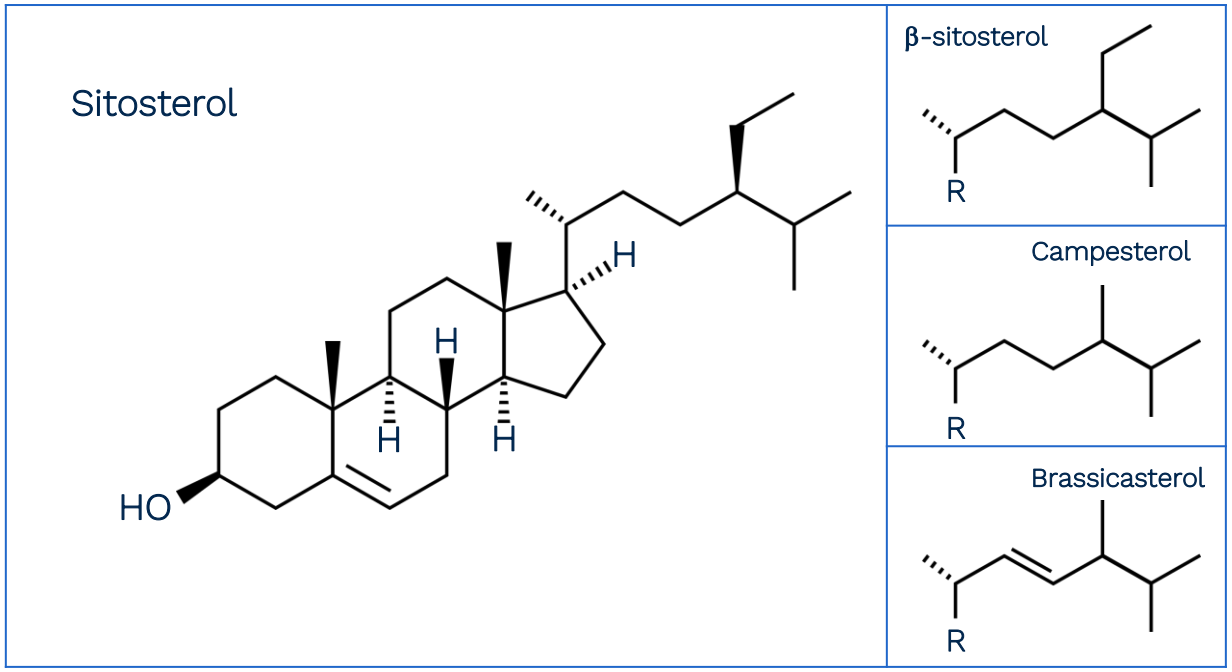
Phytosterol composition of canola oil

Main sterols: 450–11300 mg/kg

- Beta-sitosterol: 48%
- Campesterol: 35%
- Brassicasterol: 10%

Beta-sitosterol, the main sterol in canola oil, is similar to cholesterol which occurs naturally in the skin and acts as a good moisturizing and soothing agent.

Structure of phytosterols in canola oil



The side chain (top right) differs for each sterol

Canola based portfolio from AAK

Note on INCI names: those listed show our AAK preferences but are interchangeable depending on market/customer preferences. Olus Oil and Hydrogenated Vegetable Oil are other alternatives that can be used.

- **Akofine R™** - structuring agent and stabilizing triglyceride for both anhydrous and emulsion formulations.

  INCI: Hydrogenated Rape Seed Oil **Slip melting point:** 59°C

  Based on canola Akofine R is an eco-friendly, oxidative stable, powdered fat. The high melting point helps stabilize oil phases of emulsions and adds texture at low concentrations; it can also help increase the melting point of cosmetic stick formulations. Nb >1% Erucic acid
- **Lipex 120™** – antioxidant stabilized oil naturally rich in omega-3, omega-6 and omega-9 fatty acids.

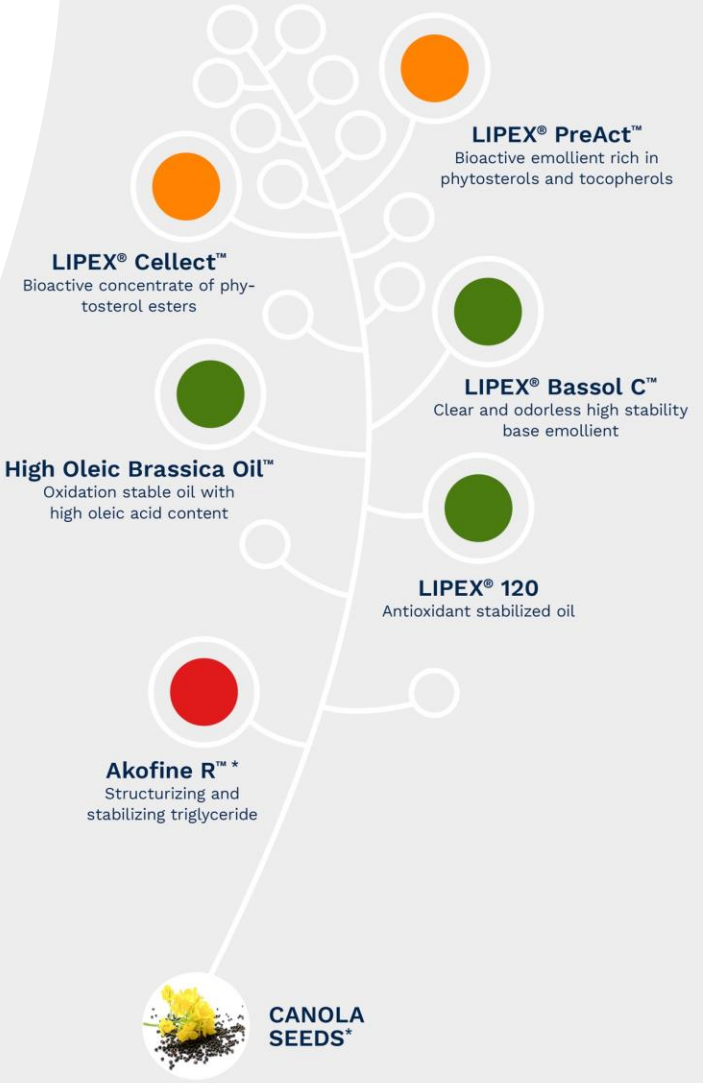
  INCI: Canola Oil **Cloud point:** -16°C **OSI index:** 12h at 110°C

  Added antioxidants help extend the quality and shelf life of formulations (typically 5 hours at 110°C for traditional vegetable oils) and also enhance the functionality of the polyunsaturated fatty acids. Suitable for general skin care applications.
- **High Oleic Brassica Oil™** – oil with high C18:1 content offering good oxidative stability.

  INCI: Brassica Campestris Seed Oil (EU), Brassica Campestris (Rapeseed) Seed Oil

  Cloud point: -10 °C **OSI:** 16 hours at 110 °C

  Rich in monounsaturated fatty acids and with a low content of polyunsaturated fatty acids, High Oleic Brassica oil offers a longer shelf-life than traditional vegetable oils and is suitable for use as a low-cost base emollient across a range of cosmetic applications.



Lipex Bassol C™ fact file

INCI: Canola Oil

OSI: 40h @ 110°C

Viscosity: 86 cP (20°C) / 38 cP (40°C)

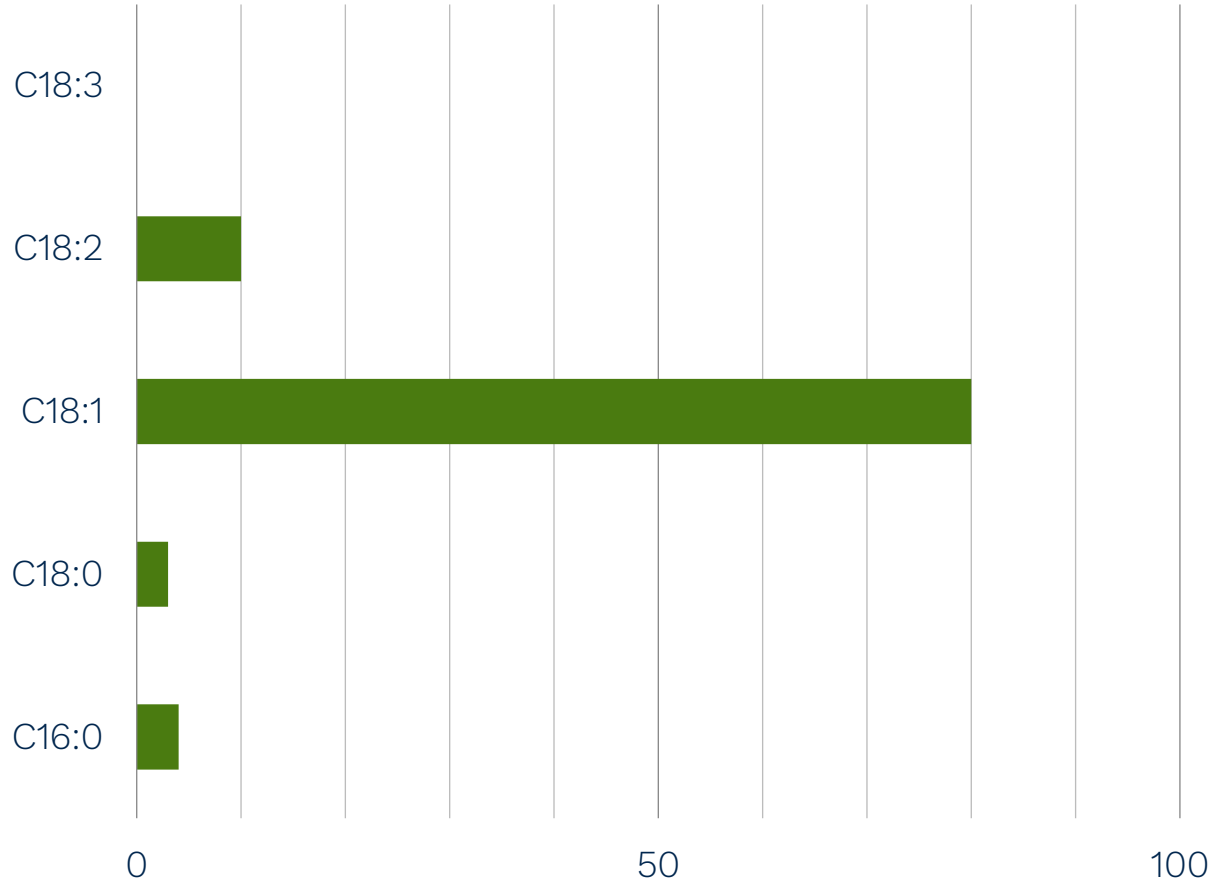
Cloud point: -8°C

Approved by ECOCERT RAW MATERIAL COSMETICS

COSMOS APPROVED

HALAL FEED AND FOOD INSPECTION AUTHORITY

Fatty acid composition (% w/w)



Lipex Bassol C™ – functional benefits for personal care applications

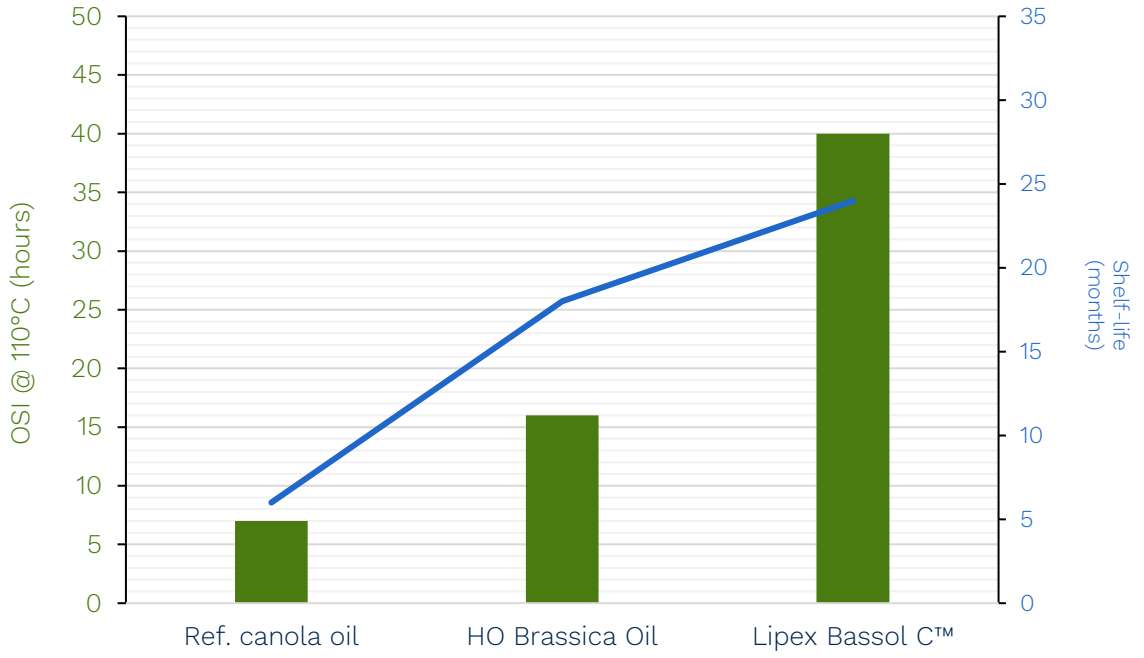
- High oxidative and photo-oxidative stability
- Clear and odorless – appearance and smell of final formulations are unchanged
- Biodegradable and suitable for cold processing
- Excellent safety profile
- Sustainable alternative to low spreading synthetic emollients
- Suitable for vegan formulations

Clean beauty
Traceable
Eco-friendly
Clear
Oxidative stable
Long shelf life

Lipex Bassol C™ – high oxidative stability without added antioxidants

- The oxidative stability is achieved by minimizing content of polyunsaturated fatty acids (PUFA's) – C18:2 and C18:3 levels.
- The test opposite compares the OSI of 3 canola-based oils measured at 110ºC. All have different levels of polyunsaturated fatty acids with Lipex Bassol C™ having the lowest concentration.
- Results show Lipex Bassol C™ has the highest oxidation stability and longest shelf life.

Oxidative stability depends on fatty acid composition and processing



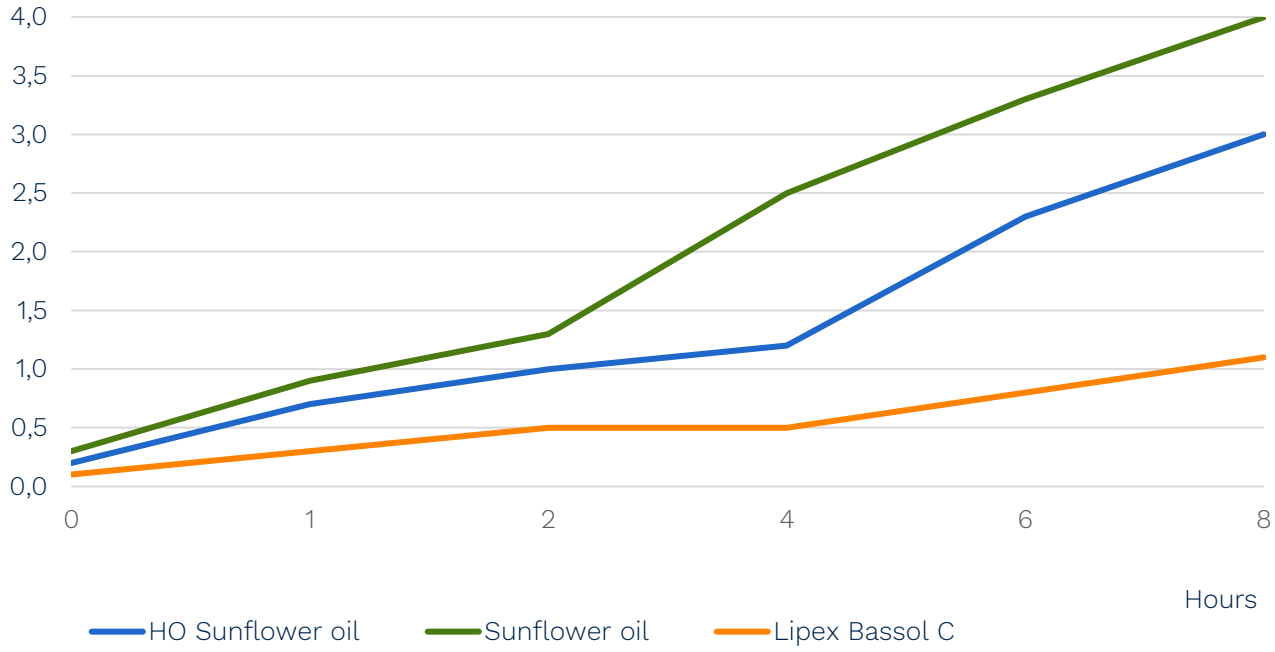
PUFA´s			
C18:2	20	14	10
C18:3	10	3	0

Lipex Bassol C™ – photo-oxidative stability at high temperature

- The peroxide value (PV) of 3 comparative oils was measured during 8 hours of UV exposure (365 nm) at a temperature of 40°C.
- Results show that the PV of Lipex Bassol C™ remains low. This confirms that Lipex Bassol C™ remains stable and functional under extreme conditions.

- Lipex Bassol C™ can therefore be used at higher concentrations with fewer/no antioxidants.

Peroxide development at 40°C and UVA radiation
UVA 365nm, at 40 °C intensity 600-700 µW/cm2



Lipex Bassol C™ in personal care applications

- Typical use concentrations:
  - 1–100% for skin care
  - 1–4% for hair care
  - 2–10% for lip care

- Recommended AAK partner products:
  - Lipex PreAct™, Lipex SheaTris™
  - Lipex SheaLight™
  - Akogel™
  - Lipex SheaLiquid TR™
  - Lipex SheaSoft TR™

Lipex PreAct™ fact file

INCI: Canola oil

OSI: >100 h @ 110°C

Tocopherol content: ~1050 mg/kg

Phytosterol content: ~8500 mg/kg

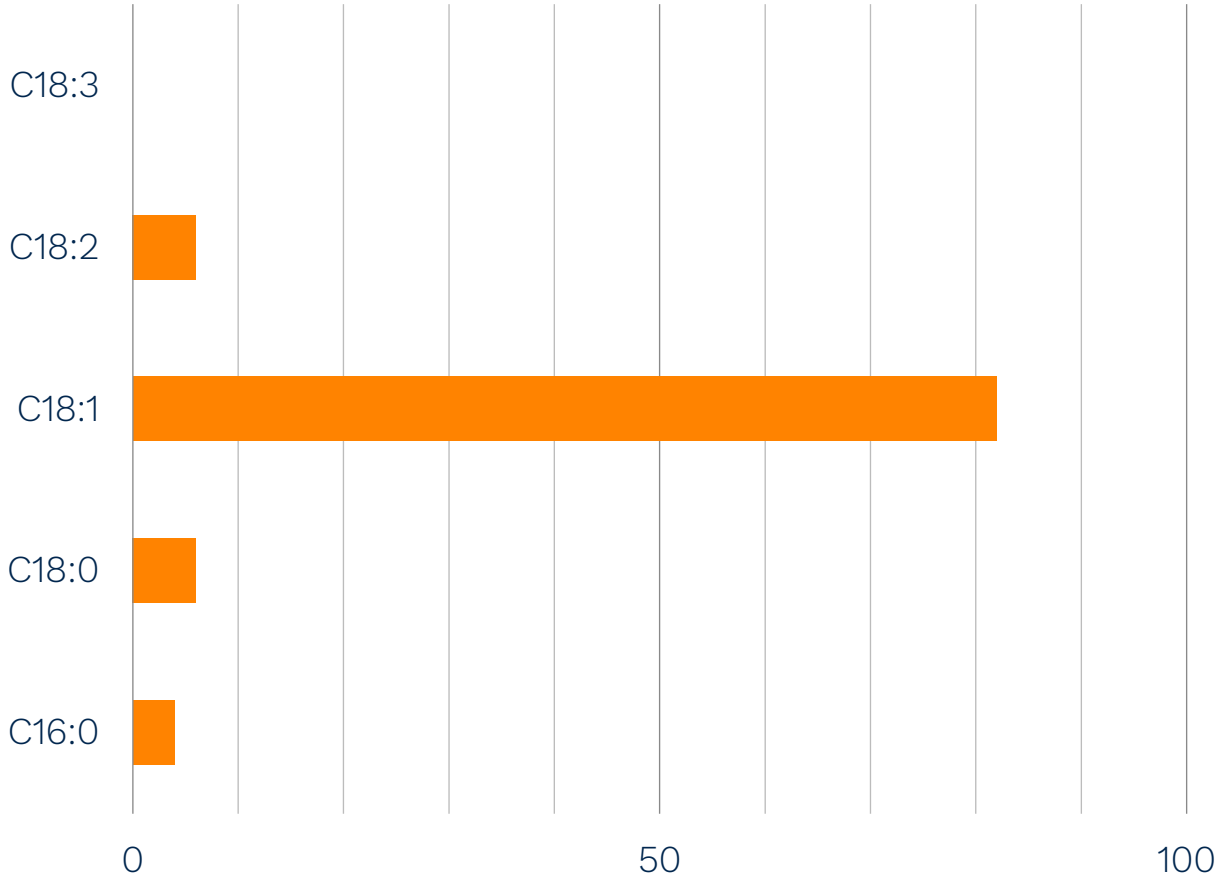
Cloud point: 6°C

Approved by ECOCERT RAW MATERIAL COSMETICS

COSMOS APPROVED

HALAL FEED AND FOOD INSPECTION AUTHORITY

Fatty acid composition (% w/w)



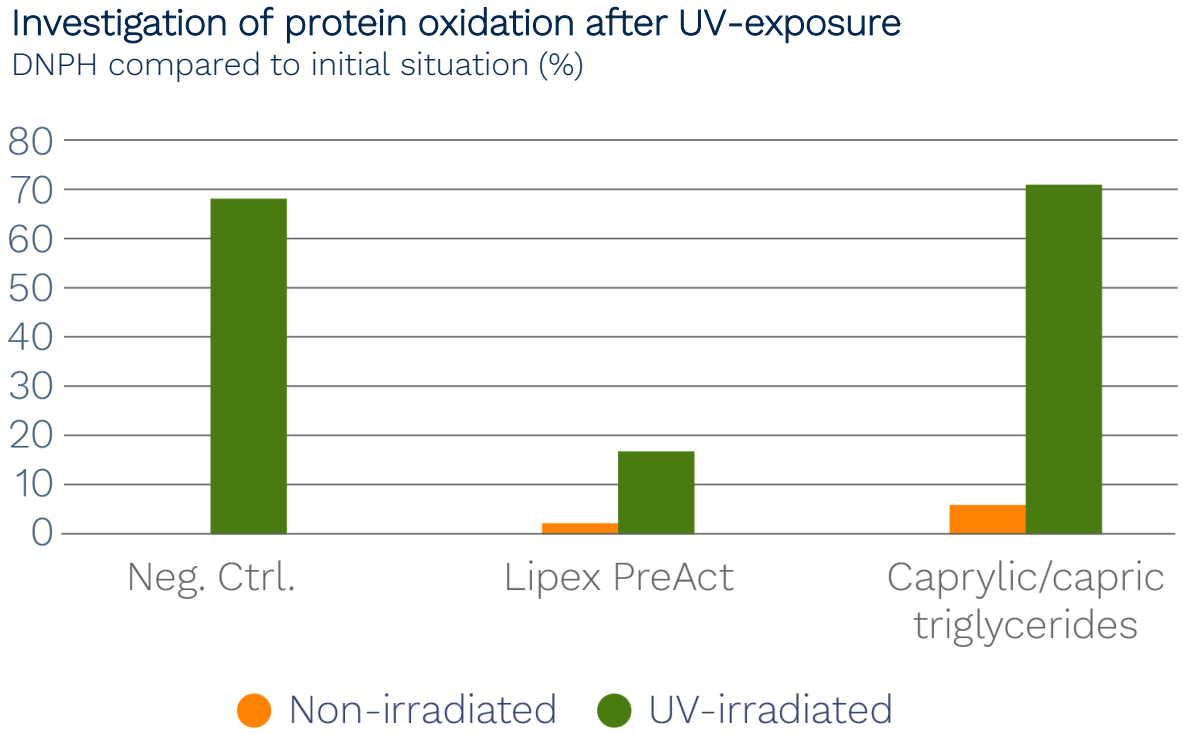
Lipex PreAct ™
– functional benefits in personal care applications

- Bioactive emollient shown to prepare and protect skin against UV radiation (PRE) and restore a compromised skin barrier function (ACT).
- Reduces oxidation of skin proteins and lipids.
- Suitable for environmental protection and after-sun formulations and skin care designed for sensitive and delicate skin.
- High oxidative and photo-oxidative stability provides long shelf-life.
- Suitable for vegan formulations.

Traceable
Skin-strengthening
Photo-protecting
Oxidative stable
Soothing
Moisturizing

Anti-oxidant efficacy of Lipex PreAct™

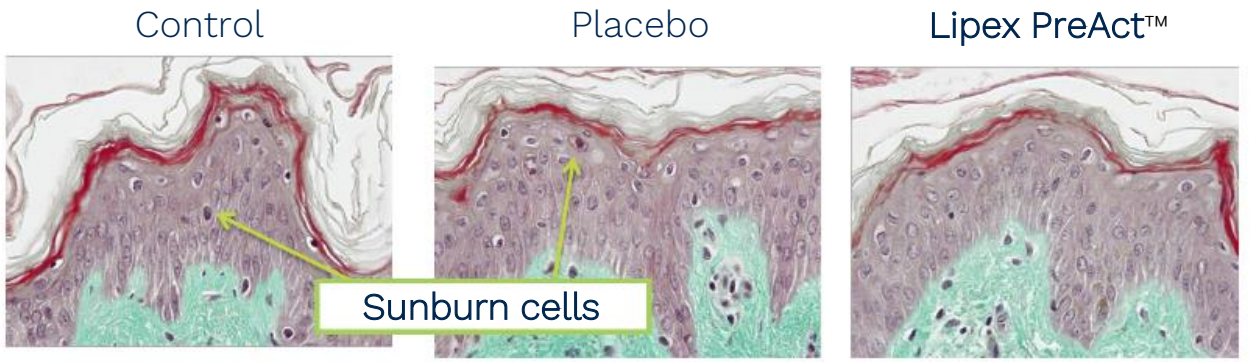
- Lipex PreAct™ offers significant protection of both proteins and cell membranes, as well as reduced formation of inflammatory mediators.
- In an in-vitro study on reconstructed human epidermal cells this is expressed as the reduction of oxidized proteins.



Protective benefits of Lipex PreAct™

- Skin explants were irradiated by UV and treated with a cream containing 3% Lipex PreAct™.
- The Lipex PreAct™ sample showed a complete absence of sunburn cells and reduced formation of thymine dimers, indicating DNA protecting capacity.

Investigation of protein oxidation after UV-exposure

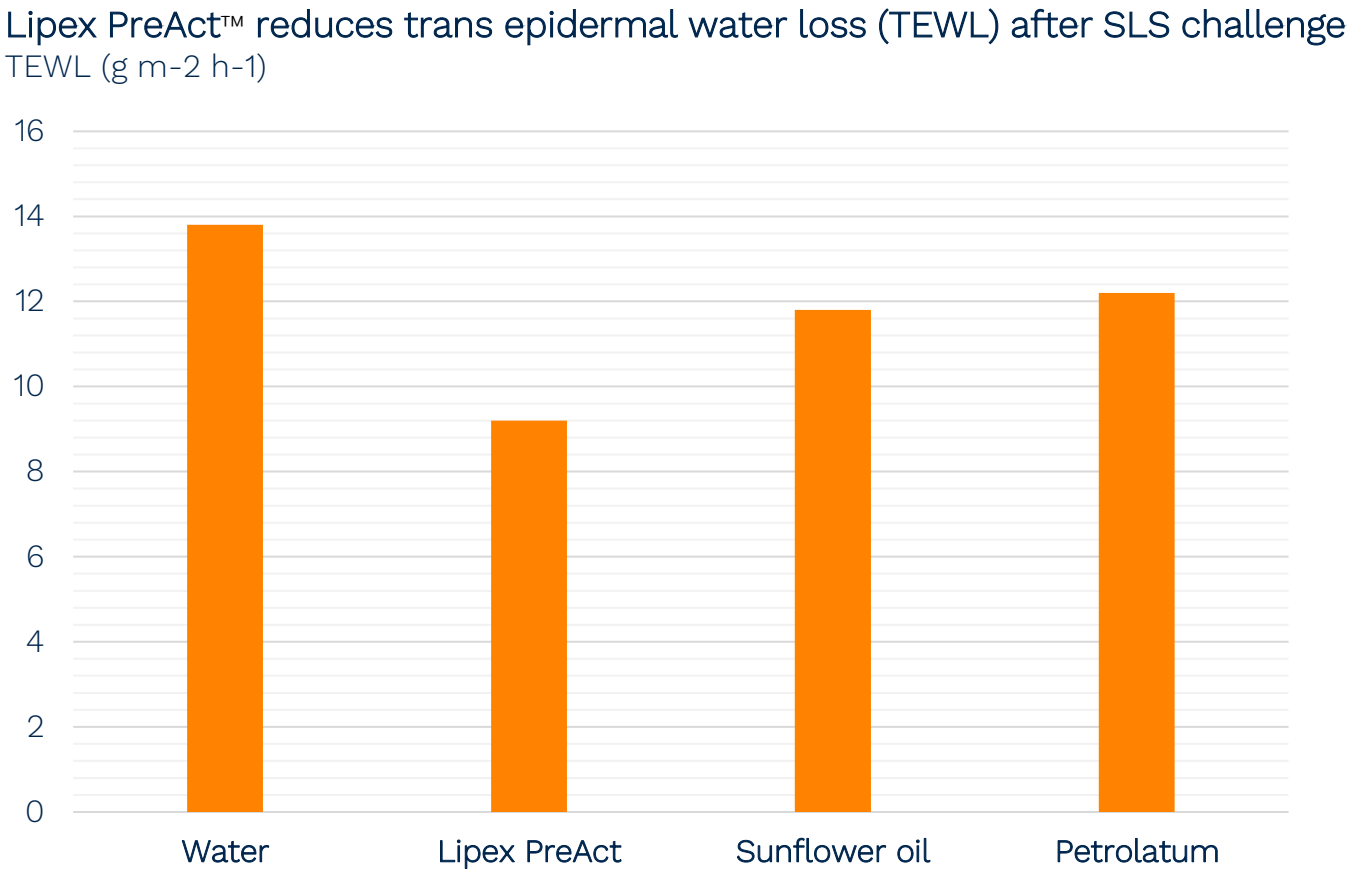


Number of sunburn cells/cm² on Day 7

Ex-vivo	Without UV		4 MED UVA+B	
Batch	Mean	SD	Mean	SD
Control	0,0	0,0	1,5	0,9
Placebo	0,3	0,6	0,6	0,5
Lipex PreAct™	0,0	0,0	0,0	0,0

Skin barrier effect of Lipex PreAct™

- Lipex PreAct™ has been clinically shown to restore the skin barrier after surfactant-induced damage with sodium lauryl sulfate (SLS)
- Effect of topically applied lipids on surfactant-irritated skin. Lodén M, Andersson AC. Br J Dermatol. (1996), 34(2), 215-20



Lipex PreAct™ in personal care applications

Typical use concentrations:

- 0.5 to 2% for skincare

Recommended AAK partner products:

- Lipex SheaTris™, Lipex PreAct™,
- Lipex SheaLight™
- Lipex SheaLiquid TR™

Lipex Cellect™ fact file

INCI: Phytosteryl canola glycerides

OSI: 80 h @ 110°C

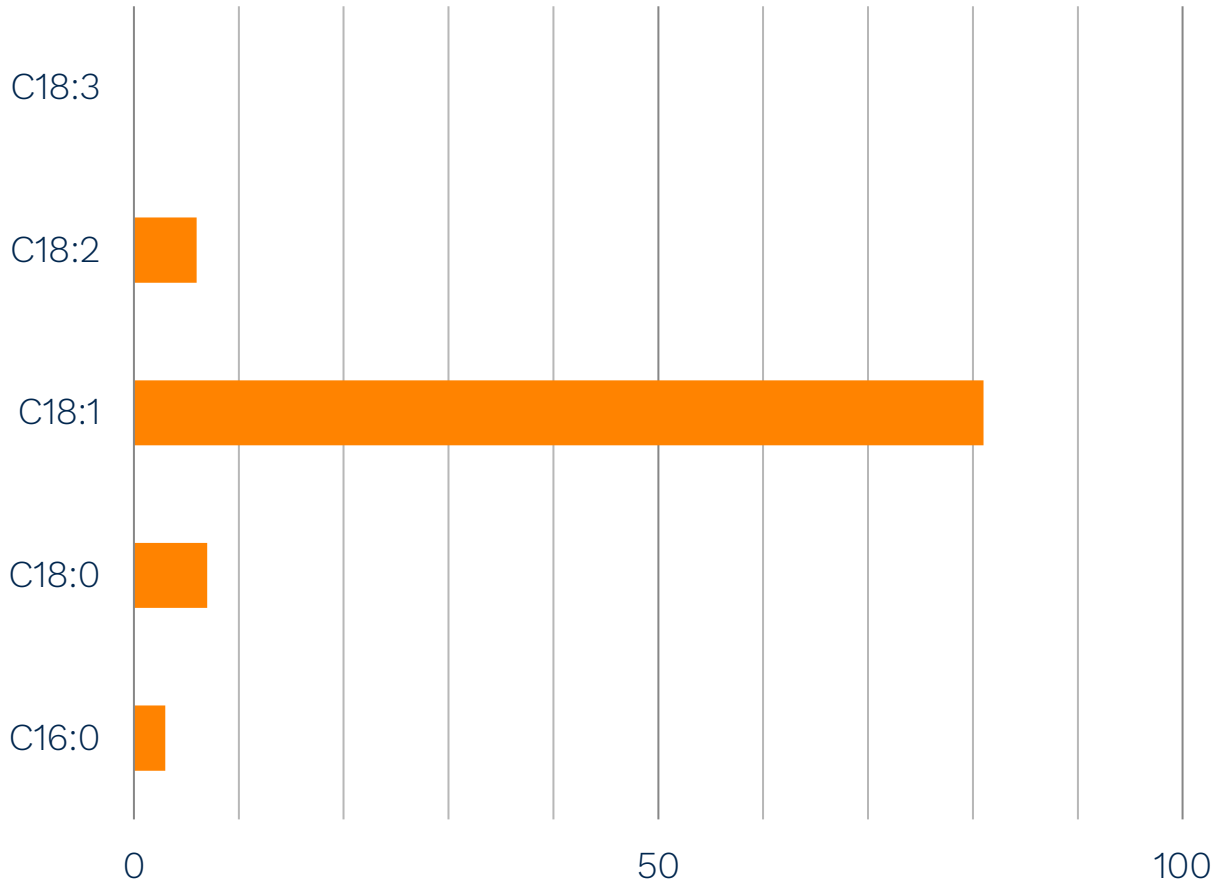
Phytosterol ester content: 45%

Free phytosterols: max 4%

Slip melting point: 44°C

HALAL FEED AND FOOD
الطيب HALAL TAYYIB الحلال
H00103 01613 A0097 AS
INSPECTION AUTHORITY

Fatty acid composition (% w/w)



Lipex Cellect™ – functional benefits in personal care applications

- Bioactive phytosterol ester with soothing and calming properties
- Reduces inflammatory response from external challenges, such as pollutants
- Re-lipidizing action from phytosterols
- Suitable for sensitive and mature skin
- Suitable for vegan formulations

Calming
Soothing
Anti-inflammatory
Rebalancing
Moisturizing
Ideal for sensitive skin

Claimed benefits of phytosterols in skin and hair care applications

- Recovery of skin barrier function
- Improved skin elasticity and decreased skin roughness
- Increased collagen and hyaluronic acid production

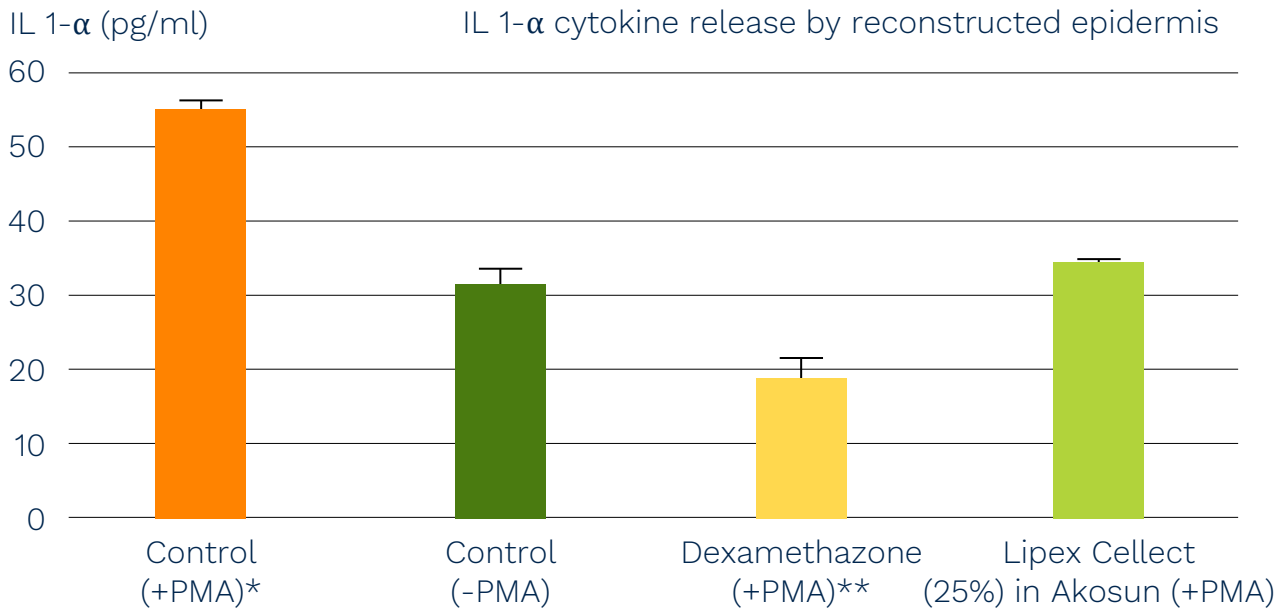
Factors influencing efficacy of phytosterols

- Esters have better bioavailability than free sterols due to large difference in melting points and solubility
- Side-chain structure determines rigidity and bio-availability
- Phytosterol composition is dependent on origin and processing

Soothing effect of Lipex Cellect™

- Lipex Cellect™ helps to sooth and calm irritated skin due to its anti-inflammatory properties.
- The phytosterols can also help to increase moisturization and barrier properties by physical action.

Lipex Cellect™ decreases inflammatory response in vitro



* Phorbol myristate acetate, pro-inflammatory agent, (5 µg/ml) added to culture medium
** Reference compound (0.1 µM)

Epidermis cultures were topically treated with 3 µl each test compound.

Lipex Cellect™ personal care applications

Typical use concentrations:

- 1–5% for skin care
- 2–10% for lip care
- 1–3% for sun care

Recommended AAK partner products:

- Lipex SheaTris™, Lipex Cellect™
- Lipex SheaLight™
- Lipex L’sens™
- Lipex SheaLiquid TR™
- Lipex SheaSoft TR™
- Lipex Bassol C™

Making Better Happen™

It’s what we do.
[Push the boundaries of possibilities through technologically advanced natural emollients.]

It’s what we challenge you to do.
[Use our value-adding solutions to develop innovative and superior quality formulations.]

It’s what we can do together.
[Change perceptions of natural ingredients and their use by continuously delivering performance without compromise.]