

GLOBAL

AAK Beauty and Personal Care
Magazine 2009

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New opportunities with Shea butter!

More and more customers and producers are discovering the beneficial effects of shea butter. A quick look at the market reveals this. The launch of new products containing the ingredient in 2008 was 25 percent up on 2007 (Source Mintel).

Shea butter is an important raw material for AAK's beauty and personal care ingredients. As market leader we feel great responsibility concerning the production of the raw materials we use. This is why we are working closely with the United Nations to better living conditions for the women who pick the shea kernels. AAK representatives in Burkina Faso supervise production, working closely with UN personnel in a development project. Thanks to this project many villages now have mills which make grinding of the shea kernels more efficient and lessen the workload of the women. Electrification, in addition to running the mills, has also opened up a whole new range of possibilities for the villages involved. A simple thing like the inhabitants being able to charge their mobile phones, facilitates communication between communities and brings about improved one-to-one contact between human beings.

Shea butter contains, among other things, triterpenes, which are unsaponifiable and have healing properties for skin. On page 6 the AAK Lipid Expert explains the secrets surrounding unsaponifiables in vegetable oils, information that may open up new opportunities for your company. If you have any questions, feel free to contact the expert. Or why not join one of our seminars at the AAK ACADEMY™? These are free for all customers.

Finally, I would like to highlight Lipex® Sheasoft – a unique product developed on demand from one of our customers. Lipex® Sheasoft has a stable melting profile that can give your shea butter products greater stability and consistency. It is both high-melting and soft. This means that your body butter won't melt during the summer holidays or get hard and stiff in winter, page 4.

Enjoy!



Rita Leissner

Editor
Rita Leissner

The natural way to create advanced skin care products

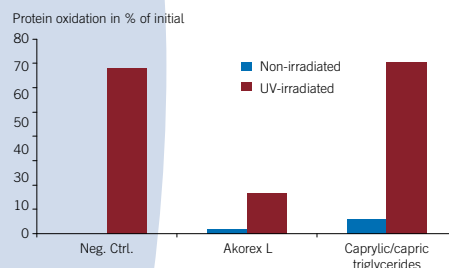
Developing natural skin care formulations to target sensitive and dry skin conditions is a challenge. But with AAK functional tools such as the lipophilic actives and emulsifiers, derived from natural sources, you can now formulate safe and elegant natural treatment products.

Skin caring formulations for delicate skin require well formulated products and a good awareness of skin functionality. The key to success is a careful selection of emollients, emulsifiers, humectants and actives. AAK offer a complete range of naturally derived and safe ingredients for your formulations, including high quality vegetable oils, lipophilic actives and naturally derived emulsifiers. Thanks to their mild character and skin moisturising, caring and protecting properties, they are well suited for treatment formulations.

Natural Lipophilic Actives

Akorex L (high stability canola oil) and Lipex® Collect (Phytosteryl Canola Glycerides) are innovative vegetable emollients with enriched high content of natural tocopherols (Vitamin E) and sterolesters. Tocopherols are well known potent natural antioxidants and sterols are known for good membrane stabilising properties. Both tocopherols and sterols are also shown to be efficient anti-inflammatory agents due to their leucotriene inhibiting capacity, properties supported by literature data.

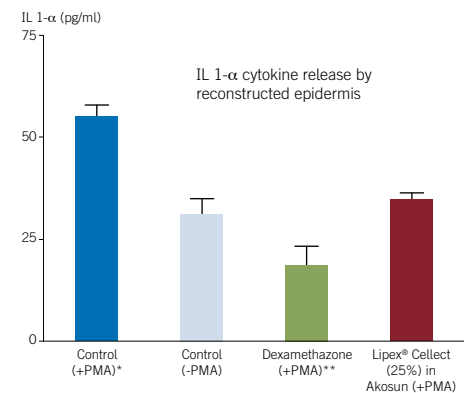
Figure 1. Akorex L efficiently protects UV-irradiated human skin cells.



The protective effect was studied in normal human epidermal keratinocytes irradiated with simulated solar UV radiation for 60 minutes at room temperature.

The good content of actives in Akorex L and Lipex® Collect have demonstrated both photo-protecting capacity and anti-inflammatory properties, confirming their capacity to provide protection against environmental aggressions (See Figures 1 and 2).

Figure 2. Lipex® Collect significantly reduces inflammatory reaction in human skin cells.



* 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 of each test compound.

The protective effect was studied in normal human epidermal keratinocyte cultures exposed to a pro-inflammatory agent (PMA) by measuring cytokine release.

Accordingly, dermal application of the lipophilic actives has the potential of strengthening the skin barrier, reducing damage of oxidative and environmental stress conditions and soothing the skin in a natural way.

Improved Skin Penetration

The composition of the formulation has an important effect on the penetration of hydrophilic as well as lipophilic actives through the stratum corneum (SC). However, the mode of actions are complex and not yet fully understood.

Lipophilic actives such as natural tocopherols and sterolesters have the potential of penetrating the upper skin surface by diffusion within the lamellar structures in the intercellular region of the SC. Thanks to structural similarities, they have



Bioactive natural oils bring valuable skin benefits.

a good affinity to the lipid matrix and this will further facilitate diffusion and favour the permeation of the actives in epidermis. The facilitated bioavailability of topically applied lipids may result in interactions with skin metabolic processes such as reduction of inflammatory mediators. The natural tocopherols may also supplement the skin's natural antioxidant system, already containing tocopherols as the most important lipophilic antioxidants.

Natural emulsifiers with humectant properties

The naturally derived emulsifiers, Akoline GC (Hydrogenated Vegetable Glycerides Citrate) and Akoline SL (Sodium Stearoyl Lactylate), offer additional skin caring properties for treatment formulations. They efficiently stabilise liquid crystalline structures formed by non-ionic surfactants, stabilising the emulsion and also contributing to good skin moisture retention. Likewise combinations of Akoline GC and Akoline SL have been shown in clinical tests to significantly improve skin firmness, elasticity and smoothness.

Thanks to a slow release of the alpha hydroxy acids in contact with the skin, these emulsifiers are well suited for mild treatment formulations, offering moisturising properties and an elegant skin after-feel.

Functional treatment formulations

Sensitive and dry skin conditions are correlated with a defective skin barrier, high water evaporation and enhanced sensitivity to environmental stress conditions. Selected functional ingredients offer a natural protection, soothing properties and good skin moisturisation – new tools for formulating safe and elegant natural treatment products.

Compositional and stability data (typical values).

Product and INCI name	Akorex L (Canola oil)	Lipex® Collect (Phytosteryl Canola Glycerides)
Tocopherols (ppm)	1000	700
Sterols (%)	0,7	45 (sterol esters)
OSI (hours @110°C)	100	80



Examples of natural sources, shea and canola.



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Shea butter made even better – Lipex® Sheasoft

Shea butter is a very useful ingredient in body care formulations. It has great skin feel, is rich in bioactive lipids and makes a difference to people in West Africa who depend on it for their livelihood.

But there are situations when the properties of traditional shea butter won't meet your requirements for stability and consistency. And this is where speciality shea butters such as AAK's Lipex® Sheasoft come in.

Lipex® Sheasoft was created as a result of a customer formulating anhydrous body butters who asked us for a high melting shea butter that would pass its stability tests at 45°C without collapsing. The first sample we sent for evaluation met the first of those criteria – its melting point was close to 65°C. And it also passed the stability test. But, unfortunately, the body butter was so hard and waxy it could not be taken out of the jar.

We needed a product that was both high melting and soft. Lipex® Sheasoft was born. It combines a melting point of 51°C with a soft consistency at room temperature.

Less solid at room temperature

The secret lies in the melting profile: Lipex® Sheasoft has less solids at room temperature compared with traditional shea butter but retains enough of them to give texture at 40–45°C. At body temperature it has just enough solids to give a softening effect on the skin without excessive oiliness. This combination of properties makes Lipex® Sheasoft unique in terms of skin feel and adds formulation versatility (see diagram)

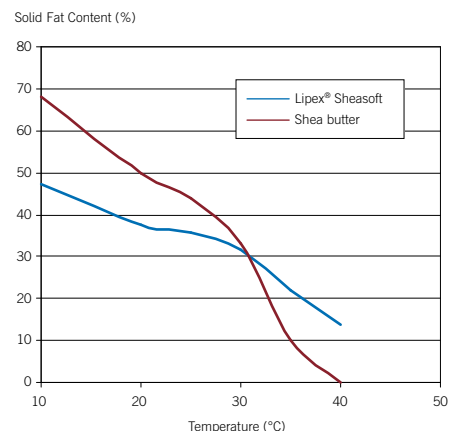
Skin conditioning and healing properties

Shea butters are also known for their good skin conditioning and healing properties. The effect is mainly due to the typical unsaponifiable components found in shea – the triterpene esters. This group of phytosterols, comprising substances such as lupeol, butyrospermol and amyirin, has well documented anti-inflammatory properties. Lipex® Sheasoft has 4–8 percent triterpene ester content, making it a good source of bioactive materials.

A rapid route to stable formulations

Formulating with Lipex® Sheasoft is easy. It combines well with all types of liquid emollients, although its properties are best expressed in combinations with natural esters and vegetable oils. In contrast to traditional shea butter, it crystallises rapidly and stabilises within a few hours without tempering. This makes it possible to use high levels of Lipex® Sheasoft in the formulations without risking graininess and separation in the end product.

Melting Profile – Lipex® Sheasoft and traditional shea butter.



Lipex® Sheasoft for body or lips

Lipex® Sheasoft is recommended for use in body care emulsions at 2–5 percent and in hand and foot creams at up to 10 percent. It brings more moisturisation and consistency to lip balms than ordinary shea butter. In facial care applications a lower concentration is recommended, typically 1–2 percent.

Because it is listed as an “ingredient of natural origin” with Ecocert S.A. (France), Lipex® Sheasoft can be used in the formulation of “natural cosmetics”.

To create a new and exciting body or lip butter, just add your favourite fragrance or essential oil to Lipex® Sheasoft.

Lipex® Sheasoft

INCI:	Butyrospermum parkii (EU), Butyrospermum parkii/shea butter (US)
Melting point:	51°C
Triterpene alcohol content:	4-8%
Fatty acid composition:	Palmitic acid 6%, Stearic acid 40, Oleic acid 45, Linoleic acid 6%



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Lipex® Sheasoft – moisturising ingredient with healing properties.



Unsaponifiabiles in vegetable oils

Vegetable oils are nature-derived ingredients that have a multitude of uses in beauty and personal care products. Alongside triglycerides you'll find differing amounts of other lipids, usually designated as "unsaponifiabiles".

Unsaponifiabiles are not esters and consequently will not be hydrolysed by a treatment with water and alkali (saponification). These non-saponifiable lipids have different functionalities, both in the plants but also as components of cosmetic ingredients.

The unsaponifiabiles that have the largest interest from a cosmetic and skin care point of view are the tocopherols, the phytosterols and triterpene alcohols. These are found in most vegetable oils in concentrations ranging from a few ppm to several percent. "Yellow oils" rich in unsaturated fatty acids often also contain high amounts of tocopherols as a natural oil-soluble antioxidant. Many cereal oils such as corn oil, wheat germ oil and rice bran oil contain both tocopherols and phytosterols in high concentrations. Triterpene alcohols are more specific and mainly found in shea butter.

Vegetable oils are an important source for Vitamin E (tocopherols)

Tocopherols have a protective function in the cells where they act as free radical scavengers and antioxidants. In living cells the tocopherols are regenerated by ascorbic acid and can consequently mop up a large amount of free radicals before they are exhausted. Tocopherols come in several isomers of which the alpha-



tocopherol has the highest antioxidative potential while gamma-tocopherol has been associated with anti-inflammatory properties. Vegetable oils differ in their tocopherol composition but alpha-tocopherol is usually the one that dominates in all oils.

Phytosterols stabilise membranes and are anti inflammatory

Phytosterols act as a structural element in cell membranes, regulating their fluidity and strength.

They form liquid crystalline phases together with polar lipids and fatty acids. The most common phytosterol is beta-sitosterol but variation between plants is considerable. Analysing the phytosterol composition is often the most certain way to identify an unknown vegetable oil. Phytosterols are important precursors for a variety of bioactive molecules. They also possess anti-inflammatory properties in vitro. In general, esterified phytosterols are easier to formulate with as they are lower melting and better soluble than free alcohol forms.

Triterpene alcohols are mainly found in Shea Butter

Triterpene alcohols are one group of phytosterols that have a slightly different chemical structure and consequently slightly different properties. Triterpene alcohols esterified to fatty acids and to cinnamic acid are characteristic of shea butter which can contain several percent of this class of substance. Other oils rich in triterpene alcohols include olive oil and rice bran oil, although the content is much lower than in shea butter. Triterpene alcohols are anti-inflammatory and may inhibit proteases that break down structural proteins in the skin.

You can learn more about the functionality of these unsaponifiabiles in cosmetic applications by participating in our free AAK ACADEMY™ seminars. Look out for dates and programmes on our website www.aak.com.

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Examples of unsaponifiable composition in some well known vegetable oils.

Unsa-ponifiable	Toco-pherols (mg/kg)	Phyto-sterols (mg/kg)	Triterpene alcohols (mg/kg)
Soybean oil	600-1 000	3 600	800
Olive oil	200-250	1 400	1 400
Shea butter	100-200	1 300	38 000
Wheatgerm oil	2 000-2 500	26 000	2 000

Source: The Lipid Handbook, 2nd edition, Chapman & Hall, 1994

More information about coming courses are available on www.aak.com

Next AAK ACADEMY™ for Beauty and Personal Care Formulations, 8-9 September in Karlshamn

Programme

- Lipid chemistry
- Natural oils for Beauty and Personal Care
- Processing and handling of vegetable oils
- Crystallisation and physical properties of lipids
- Shea Butter – from tree to skin
- Lipids in skin health
- Speciality emollients
- Controlling sensory properties with lipids
- Rinse-off applications
- Lipid based emulsifiers
- Factory and R&D tour
- Visit to QC laboratory



Lipex® L'sens – a vegetable beauty and personal care ingredient that gives good moisturisation.



Lipex® L'sens – for moisture, feel and gloss

Looking for a vegetable cosmetic ingredient that gives good moisturisation, has a velvety skin feel, glosses up lip balm and can reduce emulsifier levels in body lotion? Lipex® L'sens, originally developed as a lanolin alternative for colour cosmetics, has all these qualities.

In contrast to most other vegetable oils, Lipex® L'sens is a polar material that binds water in its structure. The soy bean glycerides interact with the emulsifiers to strengthen any liquid crystalline phases present and thus give a structuring effect in emulsions. This ability to form liquid crystals also increases moisturisation when applied to the skin. The high polarity of Lipex® L'sens is also reflected in higher than usual gloss.

Consistency and gloss in lip products

Lipex® L'sens is currently used in lip products, both in colour cosmetics such as lipsticks and pencils but also in lip balms and other protective and moisturising products. The combination of highly polar soy bean glycerides with the high viscosity of the shea butter unsaponifiables gives good substantivity to the skin and creates excellent film-forming properties. Used at 2–3 percent of the formulation, Lipex® L'sens will lend structure and gloss, while also helping to disperse pigments.

Immediate and long-term moisturisation

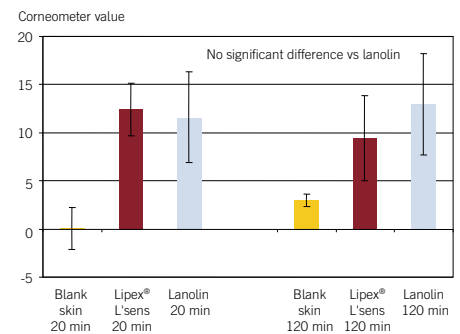
The moisturising properties of Lipex® L'sens were compared to lanolin by measuring corneometer values at both 20 minutes and two hours following application. Twenty minutes after application the skin moisture content was the same in both treated areas and significantly higher than in the untreated skin. After two hours the increased moisturisation was still evident and not significantly different from that of lanolin. However, over longer periods the effect wears off as Lipex® L'sens – a glyceride – is incorporated into the epidermal lipids (see diagram).

Body care benefits from Lipex® L'sens

Although Lipex® L'sens has been used primarily in colour cosmetics, its unique moisturisation and structuring properties can also be used in general skin care. When added at 1–3 percent in a skin care cream or lotion, viscosity increases due to the water binding ability of the soy bean glycerides. The film-forming ability of the material creates a very smooth, velvety skin feel.

Lipex® L'sens is a good example of how the properties of different vegetable oil derived materials can be combined to improve the structure, skin feel and moisturisation of formulations. Try it out in your next emulsion and you'll see what we mean.

Moisturising properties compared to lanolin.



Lipex® L'sens at a glance.

INCI name:	Soybean Glycerides and Butyrospermum Parkii Butter Unsaponifiables (EU)
Melting point:	39 °C
Hydroxyl value:	100
Recommended use level:	1-3 %

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Think green – save the earth, time and your money

A unique offer from AAK based on natural Akoline emulsifiers provides you with the opportunity to grow your business in a way that benefits the environment and saves you money by cutting production time.

Akoline emulsifiers enable you to produce innovative, valuable finished cosmetic products with proven skin benefits.

You'll be able to make process friendly, naturally light emulsions with long term stability that are sprayable and optimized for cold blending.

Sprayable emulsions with long-term stability
To succeed with a sprayable emulsion you have to prevent flocculation and coalescence and be selective about your emulsifying and stabilising system.

With Akoline LC you are able to optimise sprayable emulsion with long-term stability. The emulsifiers

promote steric stabilisation, preventing flocculation and coalescence. The polymer also promotes vital long-term stability, as it gives high viscosity at low stresses, eliminating sedimentation.

Major cost benefits

With Akoline LC you can produce process-friendly formulations – your emulsion can be produced at 30°C. The cold blend concept is easy to formulate and gives major cost benefits. An anionic emulsifier is mixed with a mild non-ionic surfactant to enable you to fulfil the requirement for a cold blend process. The Akoline emulsifier saves time and delivers excellent sensorial properties.

The multifunctional guideline formulation shown in the table are based on mild ingredients giving extraordinary skin benefits. Because they are so mild, the formulation is especially suitable in products for babies and people with sensitive skin. They are effective in cleansing milks, light body lotions, after sun products, in fact wherever the aim is a sprayable end product.

The market is asking for lighter, greener, and more beneficial products. The Akoline emulsifiers delivers on this, optimises your process and the stability of the finished product.

Cold blend, sprayable emulsion with natural vitamin E.

Ingredients	%
Akoline LC	3
Akoline MCM	2
Akorex L	15
Polysorbate 80	3
Aqua 30°C	q.s
Xanthan Gum	0.15



For more information please contact, Tina Liljegren, phone: +46 (0)454 82808, e-mail: tina.liljegren@aak.com

Akoline LC

- Suited for cold processing applications.
- Well documented skin firming and smoothing properties.
- Anionic emulsifier for o/w creams and lotions.

Save the earth, use Akoline emulsifiers.



AAK boosts women's development in Africa

AAK's collaboration with the United Nations Development Programme and the national government to improve the living conditions of women in Burkino Fasa is really making a difference.

The initiative – part of a so called multi-functional platform project started in 2003 – aims to reduce the everyday work burden of women, giving them time to take part in income-generating activities. The project educates groups of women, who then organise themselves to manage micro enterprises. New jobs are being created, some of which have never before been attempted by women. The aim is to reduce the gender gap between men and women and empower poor women in rural areas of the country.

Improving living conditions

In rural areas of Africa, poor women spend a great deal of time on basic tasks such as grinding cereals or fetching water. The project is playing a decisive role in improving the living conditions of these women and their families, for example by bringing electricity to the villages. The advantage as far as AAK is concerned, is that the women have time to collect the shea kernels we use in many of our products. But while this is the principal reason we became involved, the project is win-win for all concerned.

Moving into the Bobo zone

In the four years from 2003 to 2007, 120 project platforms were installed in Burkina Faso. At that stage the project was limited to five of the country's 13 regions with none of the big shea producing areas covered. In 2006 AAK reviewed the project with the UNDP and suggested extending it to the shea-intensive Bobo zone. When new partners such as Lux-Development, Luxembourg's de-



velopment cooperation executing agency, and the Bill and Melinda Gates Foundation joined the project, it was decided in 2008 to go ahead with this extension.

Improved efficiency

Since 2007 150 additional platforms have been established, indicating that the project has improved in efficiency. The government of Burkina Faso is showing increasing interest in the project and its

A multifunctional platform is a simple diesel engine that can power an assortment of tools, such as a cereal mill, husker, alternator, battery charger, in addition to welding and carpentry equipment. It can also be used to distribute water and generate electricity.

See more on:

<http://www.ptfm.net/old/mfpwhat.htm>

ambition is for 8,000 villages to have platforms. The project group is now seriously considering expanding into all 13 of the country's regions. Several studies have been launched to assess the feasibility of taking such a step. Results will be available soon. We will keep you updated.

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AAK

Meet AAK Beauty and Personal Care around the world

- In-Cosmetics, Munich, Germany, 21- 23 April
- NY SCC Suppliers Day, New Jersey, USA, 12-13 May
- FCE, Sao Paulo, Brasil, 26-28 May
- AAK ACADEMY™, Karlshamn, Sweden 8-9 September
- In-Cosmetics in Asia, Singapore, Malaysia, 13-15 October
- Suppliers' Day, Long Beach, USA, 22-23 October
- SCS Formulate, Coventry, U.K., 18-19 November