Synergistic complex of Alpha Hydroxy Acids

α-hydroxy acids or AHA

1 - Definitions - Origins
- Alpha hydroxy acids are carboxylic acids with an alcohol function in alpha, for example:
  \[
  \text{CH}_3\text{OH} \quad \text{Hydroxyethanoic acid (12%)} \\
  \text{CH}_2\text{OH} \quad \text{Glycolic acid (7%)}
  \]
They are naturally found in fruit and yoghurts.

2 - Function within plants
- Quite frequent among plants where they stand in a free state only in traces, these acids are very important in botanical metabolism; they especially increase the osmotic pressure of cells, hence a decrease of sweating and an increase of the resistance to dryness. There are other alpha hydroxy acids, such as ascorbic, gluconic, mandelic acids, etc...
- Alpha hydroxy and alpha acetic acids have so acid pH that, if they are applied on the skin in a pure state, they may cause a toxic contact dermatitis.

3 - AHA, NMF and the skin
- Some AHA are naturally found in the skin, where they play a role in:
  a - cutaneous hydration
    - The capacity of stratum corneum for binding water comes from, among other things, the presence in horny cells of water soluble hygroscopic substances known as NMF (Natural Moisturizing Factor). The latter contains organic acids, α-hydroxy acids, urea, amino acids and mineral ions.
  b - keratinization
    - AHA act as modulators of the exfoliation, hence their influence on the quality of keratinization. At the proper concentration, they act on intercorneocytar peptidic bounds and thus help to regulate exfoliation. Cutaneous "disorders" such as troubles of keratinization over the years, environmental attacks or hyperseborrhea may be favourably soften by AHA activity, added with their suppling, hydrotreating activity.
- The interest of AHal can thus be easily seen.

VEGELES® AHA LS 8763

**Definition / Composition**

VEGELES® AHA LS 8763 is a unique synergic complex of Alpha Hydroxy Acids strengthened with moisturizing and/or plasticizing agents of superficial epidermal layers.

The quality and concentration of the active fraction of VEGELES® AHA LS 8763 is designed for an optimal activity.

**Main components**

The constituents of VEGELES® AHA LS 8763 are of complex origin: botanical, biotechnological and synthetic.
- Alpha Hydroxy Acids.
- Oligosaccharides.
- Urea.

**NMF vs VEGELES® AHA LS 8763: analogies/distinctions**

The composition of VEGELES® AHA LS 8763 partly reproduces the NMF composition.

VEGELES® AHA LS 8763 only contains AHA being partly neutralized and at proper concentrations in order to minimize the reactions of intolerance while developing its activity: moisturizing, plasticizing, modulating the exfoliation of keratinized superficial layers.

**Mechanism of action**

- Let us consider 2 proteic chains (for ex. at the surface of corneocytar membranes) bound by hydrogen links (→) schematically:
- A AHA may move between both chains:
  - at a low concentration, the chains are slightly apart and the AHA sets a bridge between the 2 chains: the potential number of hydrogen bounds (→) has increased and the plasticization of the whole has improved,
  - at a higher concentration the proteic chains may be separate.

- The separation of proteic chains being a cooperative phenomenon, the dose-dependent curve is a sigmoid, the concentration gap between an effect being only moisturizing and an effect on the separation of the chains may be thin.

**Adantages**

- VEGELES® AHA LS 8763 act according to a similar process, of interference with the links uniting horny cells (fig. 1).

![Fig. 1 – Mechanism of action of VEGELES® AHA LS 8763.](image)

**Skin benefits**

1 **Moisturization - hydrotreating**

Making horny layers elastic. Improvement of softness and epicutaneous comfort: hence, the interest of VEGELES® AHA LS 8763 for dry and scaly skin.

2 **Renewal of epidermal superficial layers**

by activating the exfoliation or reducing the cohesion of corneocytes.

3 **Strengthening**

the natural acidity of higher cutaneous layers. This reinforces the epidermal barrier.

4 **Improvement of skin tone.**

**Cosmetic use**

- Care of dry, rough, scaly, dull skin, lacking suppleness, elasticity and shine.
- Anti-age care, NMF refill, for cell renewal, for reducing superficial lines.
- Care of some dyskeratosis.
- Care of skin with a seborrhoeic tendency.

**Advantages**

VEGELES® AHA LS 8763 only contains selected AHA and at proper and synergistic concentrations to make them efficient, with a good tolerance.

**Dosage / Solubility / Mode of incorporation**

1. **Dose of use:** 2% to 10%.
2. **Solubility:** soluble in water and hydroalcoholic solute. Insoluble in oils.
3. **Mode of incorporation:** VEGELES® AHA LS 8763 must be incorporated during processing below 50°C or at room temperature for cold processing. Optimal pH = 4. Compatible with pH comprised between 3 and 7.5.

**Analytical characteristics**

1. **Aspect:** colorless liquid with a weak odor.
2. **Specifications:** upon request.
Stimulation of epidermal cellular renewal (clinical study).

**Aim**
Demonstration of the stimulation of epidermal cell renewal of a gel containing 5% VEGELES® AHA LS 8763, by fluorescence test (Dansyl chloride).

**Protocol**
Dansyl chloride, when applied on skin, binds to keratin of horny layer cells. It is measured by the intensity of its fluorescence in wood light. Test on 15 female volunteers (42-63 years old).

**Results**
Fluorescence significantly decreases especially at D+12, corresponding to a good cell renewal.

**Conclusion**
VEGELES® AHA LS 8763 at 5% shows a significant cell renewal stimulating effect.

Moisturization (clinical study).

**Aim / Protocol**
- Measurements of dielectric conductivity of superficial cutaneous layers before and after treatment with:
  - a placebo emulsion,
  - an emulsion containing 5% VEGELES® AHA LS 8763.
- The volunteers have been placed in conditions of controlled humidity and temperature (RH = 40%; 20°C).
- The placebo emulsion has been applied on one side, the emulsion with the active on the other side at 30 minutes interval.
- Quantity of emulsion applied = 5 mg/sq.cm.
- Measurement of conductivity:
  - 5 minutes, 10 minutes, 30 minutes and 1 hour after application,
  - 2, 3 and 5 hours after application.

**Results**
VEGELES® AHA LS 8763 has a significant moisturizing effect in comparison to the placebo.

**Conclusion**
VEGELES® AHA LS 8763 at 5% shows a significant moisturizing effect in comparison to the placebo.

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**Tolerance**
Good.

**Efficacy**
Test summaries overleaf.

**Storage**
In its original packaging, at 15-25°C.

**INCI Name**
Water (and) Glycerin (and) Sodium Lactate (and) Glycolic Acid (and) Sucrose (and) Urea (and) Sodium Citrate (and) Malic Acid (and) Tartaric Acid.

**Manufacturer**
Laboratoires Sérobiologiques S.A.

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**EFFICACY TESTS**

**Fig. 3** – Decrease of the level of skin fluorescence in the treated area when compared with the control area on the inner side of the forearms, on the third and the twelfth days after patch removal. Semi-quantitative quotation.

**Fig. 4** – Observation of fluorescence in Wood light. Comparison of the intensity on both forearms, before and after 12 days of treatment.

**Fig. 5** – Strengthening effect of VEGELES® AHA LS 8763 on cutaneous conductivity kinetic evolution over time.