



OLIVOIL

AVENATE

SURFACTANT

Innovative and mild surfactant

Highly functional ingredient

Considerable moisturizing foam

Nourishing action

Emollience and silky features

Ecocert and Cosmos Certified



OLIVOIL PRODUCTS

“PEG-FREE” SURFACTANTS OF VEGETAL ORIGIN INTERNATIONALLY PATENTED

>> PRODUCTS BACKGROUND

In the modern concepts of wellness, now consisting in the responsible respect of both body and skin equilibrium and environment, the wide success of ingredients of natural origin is due to two key aspects. **Firstly, the need for developing formulas compatible as much as possible with the physiology of skin and its annexes, without any adverse effect or allergic potential. Secondly, the growing confidence of the consumers in the beneficial properties provided by complex mixtures of natural ingredients.** The quest for PEG-free surfactants and emulsifiers led Kalichem to the creation of new classes of base ingredients for skin-friendly and environmental-friendly cleansing cosmetic products, the OLIVOIL Series. These ingredients of vegetal origin are ethylene oxide free and highly performing in cosmetic formulations. Moreover, they provide the skin with the pleasant accompanying effects of vegetal structures.



>> THE ORIGINS

Extra-virgin Olive oil is obtained by cold pressing the pulp of the fruits of *Olea europaea* (Olive), a species of small trees of the family Oleaceae, native to the coastal areas of the eastern Mediterranean region from Lebanon, Syria, the maritime parts of Asia Minor to the south end of the Caspian Sea and successively cultivated in all the Mediterranean area. Its stone fruit, the olive, is of major agricultural importance in the Mediterranean region as the source of olive oil.

Olive oil shows the following complete composition:

Myristic acid $\text{CH}_3[\text{CH}_2]_{12}\text{COOH}$		COOH	1%
Palmitic acid $\text{CH}_3[\text{CH}_2]_{14}\text{COOH}$		COOH	15%
Palmitoleic acid $\text{CH}_3[\text{CH}_2]_5\text{CH}=\text{CH}[\text{CH}_2]_7\text{COOH}$		COOH	1%
Heptadecanoic acid $\text{CH}_3[\text{CH}_2]_{15}\text{COOH}$		COOH	0,5%
Stearic acid $\text{CH}_3[\text{CH}_2]_{16}\text{COOH}$		COOH	4%

Oleic acid $\text{CH}_3[\text{CH}_2]_7\text{CH}=\text{CH}[\text{CH}_2]_7\text{COOH}$		COOH	68%
Linoleic acid $\text{CH}_3[\text{CH}_2]_4\text{CH}=\text{CH}-\text{CH}_2\text{CH}=\text{CH}[\text{CH}_2]_7\text{COOH}$		COOH	9%
Linolenic acid $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}-\text{CH}_2\text{CH}=\text{CH}-\text{CH}_2\text{CH}=\text{CH}[\text{CH}_2]_7\text{COOH}$		COOH	0,5%
Others			1%

Widely preferred to other vegetal oils for its high amount of mono-unsaturated fatty acids, it exhibits well-known properties of integration with the body physiology. Olive oil has the undoubted advantage of its lipidic fraction, provided by a millenary history of contact with vital human cells, which thus allows to boast high safety standards. When the complex of its lipidic chains is chemically combined with hydrophilic molecules of known performances, functional ingredients suitable for innumerable cosmetic formulations can be created. Another interesting aspect of olive oil properties concerns its unsaponifiable fraction (0.6-1.5%). This fraction is kept unchanged in the finished material. Its antioxidant power, as well as the emollient effects of the lipidic moiety, contributes to skin normalization and protection.

VEGETAL PROTEINS

FROM THE ENVIRONMENT THE BASE OF NEW COSMETIC RAW MATERIALS

PRODUCTS BACKGROUND <<

Once there were animal proteins... Used as active ingredients of primary choice for most cosmetic formulators, they offered economical, functional molecules of acceptable color and odor in a variety of forms. For known reasons, today's cosmetic chemist is faced with the challenge to replace the traditional animal-derived proteins with ingredients offering the same functionality. Plants have traditionally been viewed as renewable sources of supply, as they are "harvested" on an annual basis. In addition, consumers often associate plant and vegetal derived products with improved health and cleanliness. Plant proteins are devoid of stigmas associated with the developments in BSE (Bovine Spongiform Encephalitis) and other diseases related to animals.



HYDROLYZED OAT PROTEINS

Oat is the only cereal containing a globulin or legume-like protein, avenalin, as the major (80%) storage protein. Globulins are characterized by their water solubility. Because of this property, oat flour may be turned into milk but not into bread. The minor protein of oat is a prolamine (typical cereal proteins such as zein) called avenin. Oat protein properties are comparable to soy proteins, which the World Health Organization considers to be equal to meat, milk, and egg protein. The proteins of the hulls of oat kernel ranges from 12 to 24%, the highest among cereals. Moreover, the hydrolyzed protein fraction generally contains an average amount of beta-glucan of 3%. It has skin healing power, stimulates collagen synthesis, promotes cellular turnover, protects and moisturizes the skin. Kalichem Italia srl has selected hydrolyzed proteins from wheat and oat which do not incorporate any genetically modified organism (GMO).

The Oat derivate is known in cosmetics industry for its soothing properties. The emulsifiers based on Olive Oil and Hydrolyzed Oat protein have a very fast absorption rate on the skin, a silicone-like touch and are suitable for the formulation of skin care cosmetics for delicate areas of the body (peri-ocular area, for instance), as well as for sensitive skins. The surfactants based on Oat derivate are ideal where an extremely mild cleaning action is required: intimate washes, shampoos, body washes for sensitive skin and hair.



OLIVOIL TECHNOLOGY

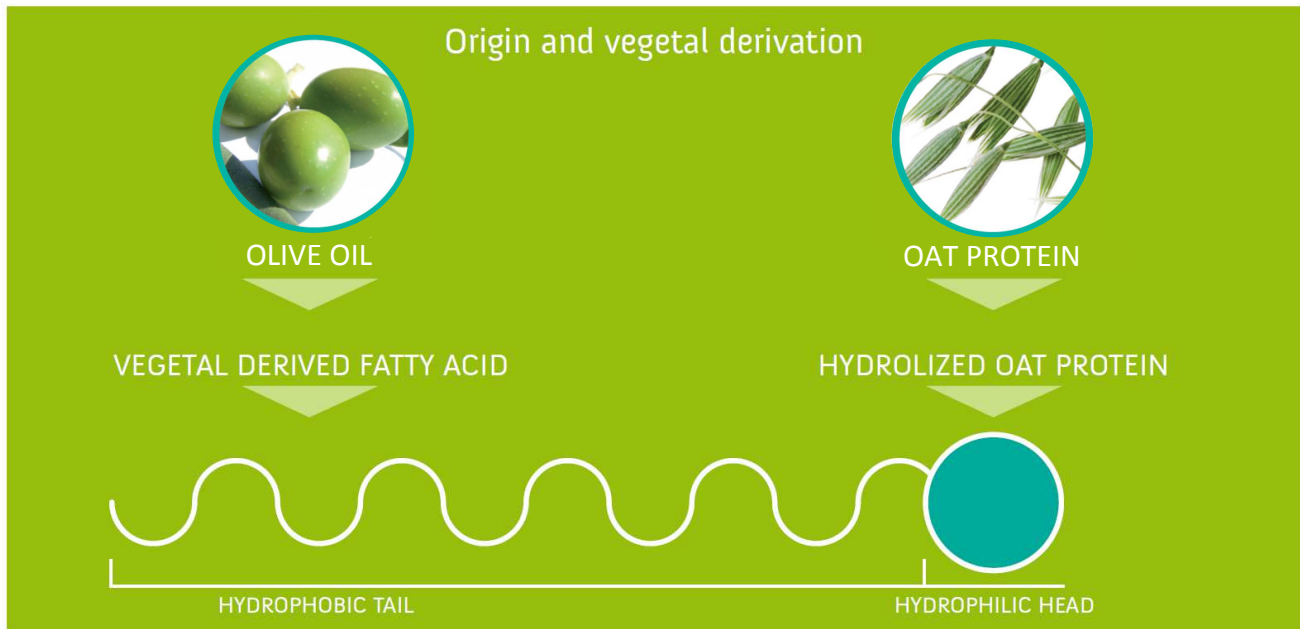
ITALIAN INNOVATION FROM THE OLIVE FRUIT

>> THE TECHNOLOGY

Combining the best of both vegetal oils and protein sources allowed Kalichem to achieve new molecules having relevant interfacial properties.

These new surfactants can be used to formulate “totally natural” finished products that are very suitable for sensitive skin, baby-care, hair-care and personal-hygiene. Furthermore, besides being extremely performing as vehicle ingredients (as surfactants and emulsifiers), thanks to their special composition they may act as functional substances with protecting, soothing and restoring ability.

As for their environmental impact, they are characterized by high biodegradability (according to the CEE regulation N.82/242 OECD Method).



Bibliography

1. Watts R, Sousselier L: "Fruits of the gods" - Soap, Perfumery & Cosmetics : October (2000), 63-8;
2. Kiritsakis AK: "Virgin olive oil composition and its effect on human health" - Inform, (13) 3 (2002), 237-41;
3. Sousselier L: "Novel ingredients from Olive-nature's gift for beauty"- 131 (88) 12-8;
4. Montgomery, Dryer R, Conway T, Spector A: Biochimica – Aspetti medico biologici, Ed.Ermes, III edit. (1981), Cap. 8, 429;
5. Kruh J: Biochimica-aspetti medici e biologici. ED.Scientifiche e Tecniche Mondadori, I edit. (1976) IV,339;
6. Rigano L, Sirigu S: "Analisi sensoriale: uno strumento della qualità in cosmetica" - Cosmesi Dermatologica 47 (1997) 81-94;
7. Stone H, Mc Dermott BJ, Sidel JL: "The importance of sensory analysis for the evaluation of quality" - Food Technology: June (1991).
8. Stone H, Sidel JL: "Sensory evaluation practices"- Academic Press Inc. (1995).
9. Hootman RC: "Manual on descriptive analysis testing for sensory evaluation"- ASTM manual series: MNL 13 (1992).
10. I.F.S.C.C. Monograph: "Principle of Product Evaluation: Objective Sensory Methods"- (1995) 1, 7.
11. Olivoil products- Brochure, By Kalichem Italia S.r.l.
12. Technical file: Olivoil PCA, BY Kalichem Italia srl
13. Technical file: Olivoil AVENATE BY Kalichem Italia srl
14. Rigano L, Giammarrusti G, Rastrelli F: "Vegetable Oils – The Base of New Active Principles" - SÖFW Journal, 132 (2006) 1-2, 25-33
15. Lasztity R (1999). The Chemistry of Cereal Proteins. Akademiai Kiado (English). ISBN 978-0849327636
- 16- D'Angelo, M.Proseprpio, G.Rastrelli GB: "An Olive Oil and wheat derived lipoprotein emulsifier, C&T 116 (2001) 8, 45-6

OLIVOIL AVENATE

PEG FREE, SULFATE FREE, PALM FREE SMOOTH SURFACTANT

PRODUCT BACKGROUND <<

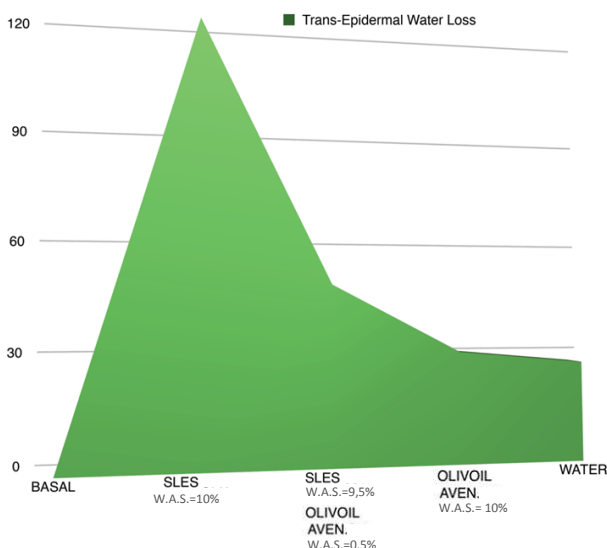
A new poly-functional surfactant with mild cleansing power and emollient ability, sensorially perceivable both during and after cleansing. Its structure is the balanced combination of whole lipids from olive oil and hydrolyzed oat proteins. Obtained through an environmentally friendly process, it is the eligible surfactant that significantly reduces the aggressive behavior of traditional anionic surfactants on skin. Even at medium to low use percentages, it changes the skin cleansing mechanism, avoiding denaturation of horny layer's proteins or excessive skin lipids dissolution. While forming a pleasant and stable foam, it leads to a cutaneous normalizing action, leaving the skin soft and supple. Useful for the modern healthy skin cleansing products, it may be used as the main surfactant for the formulation of detergents for sensitive, very dry and atopic skin types.

COSMETIC APPLICATIONS

Olivoil Avenate can be added to traditional anionic surfactants, in order to noticeably reduce the irritation potential of the cleansing action. It may also be used as primary surfactant for very mild cleansing cosmetics. Furthermore, thanks to the hydrolyzed protein fraction and the beta-glucan content, it may act as functional ingredient, leading to skin benefits such as moisturization, emollience, soothing and protective effects.

EVALUATION STUDY OF THE MILD PROPERTIES << OF THE OLIVOIL AVENATE SURFACTANT

The aim of the study is to evaluate the proprieties concerned with the respect of the cutis integrity of three cleansing products containing Olivoil Avenate Surfactant through values of transepidermal water loss, pH and colorimetry. The TEWL test (*) values are summed up in the following diagram which shows the average TEWL increase after repeated skin washing for 5 consecutive days by 12 volunteers for each cleansing product: the basal value, which is represented equal to 0 (no variables for a subject that has not used any cleansing products), increases greatly after washing with SLES (W.A.S. = 10%), resulting in dry and tensed skin. Other 2 skin areas treated with SLES in association with OLIVOIL AVENATE, a lipoproteic mild surfactant which protects the integrity of skin structure and hydrolipidic film, show a significantly lower TEWL increase when compared to the area treated with SLES only. The dryness and tension observed on the areas treated with sole SLES, here were almost totally absent. Another skin area has been treated with OLIVOIL AVENATE only and in this case there was a lower TEWL increase with respect to all other areas tested, similar to the result obtained after washing with tap water. In a repeated arm wash test carried out on 12 volunteers at ISPE Laboratories Milan, cleansing with Olivoil Avenate at 10% dry substance solution, the OLIVOIL AVENATE did not induce any significant skin reddening after daily washing with the surfactant solution, four times a day, for 4 days and twice on the last day. pH values and TEWL values were measured at the end of the test. The pH value changes were kept below 1 unit (average from 5.3 to 6.2), while the TEWL average increase was kept below 2 units (from 6.5 to 8.4 g/m²h, a value which is comparable to that obtained when washing the skin with water only).



The test shows the following advantages:

- 1) OLIVOIL AVENATE is a surfactant that does not have any aggressive activities on the skin structure and the integrity of the hydrolipidic film, as it determines the same TEWL value obtained with tap water.
- 2) OLIVOIL AVENATE has a protective action on the skin against aggressive chemical surfactants.
- 3) OLIVOIL AVENATE has this protective action on the skin at low percentages (2%) as well as at higher ones (10%).

(*) The skin hydration depends on the integrity of the skin structure, namely on the integrity of the chertine proteins protecting the skin, on the good balance of lipidic substances present on the skin which, together with others like sugars, mineral salts, aminoacids and urea, form the hydrolipidic skin film which retains the right quantity of water on the skin, so as to deliver the correct and physiological degree of hydration making it transpire with no occlusions. The skin transpiration is measured by means of a gadget taking the TEWL value (tras-epidermal water loss), that is the quantity of water vapor released by the skin with time: a high value shows that the skin is losing too much water and that it cannot retain it because of an alteration of the skin structure (hydrolipidic film and chertine) resulting in dry, thin and little elastic skin. The products used in routine daily skin cleansing operations may contain aggressive chemical surfactants which alter the skin structure removing the hydrolipidic film. The skin can no longer retain water (increase of TEWL) and therefore becomes dry and tensed.

>> OLIVE OIL AND SOFTNESS OF OLIVE OIL PRODUCTS IN DETERGENCY

One significant characteristic of the Olivoil Products is given by the presence of long chain fatty acids, including oleic acid (68%), linoleic (9%) and linolenic (0,5%) and others like myristic acid, ...

Their presence explains the results of the tests carried out on the surfactants concerning their highly smoothing performance. A number of scientific tests show, in fact, that the molecules with short chain fatty acids, like for instance the lauric acid (12 carbon atoms), have a greater irritant power than the long chain fatty acids whereby the irritant power of a surfactant is influenced by the number of carbon atoms in the fatty acids. These fatty acids of olive oil bound to oat proteins have more similarities to both cutaneous secretion (sebum) and cutaneous structures themselves (chertine) making the Olivoil products very tolerable at the cutaneous level and thus giving the finished products containing them a very nice psychoreologic effect. The Olivoil products have an effective functional action, very soft and moisturizing, according to a correct cutaneous physiology. They leave a good feel of hydration, moisturization, smoothness, softness and cleansing on the skin: after using a detergent containing an Olivoil product, one has a feel of cleanliness, satisfaction and well-being.

Olivoil products are used in association with aggressive traditional surfactants (like SLES, reducing its irritant effect) in percentages ranging from 2% to 15% depending on the desired effect. To merely reduce the irritant effect of traditional surfactants, low percentages of Olivoil products (2 - 5%) may be employed. Higher percentages of Olivoil products are suggested (5 - 15%) where an immediate feel of moisturization, smoothness and softness wants to be additionally achieved. Moreover, the higher the percentage of Olivoil used, the higher the sensory eudermic effect obtained.



WAY OF USE

	RANGE
pH of use	5,5 ÷ 7,5
Concentration as primary surfactant	from 20%
Concentration as secondary surfactant	from 2%

EXAMPLE OF FORMULATION >> FRUIT SUGAR SHOWER GEL

Phase	INCI NAME	% p/p
1	POTASSIUM OLIVOYL HYDROLYZED OAT PROTEIN, AQUA (OLIVOIL AVENATE - Kalichem Italia)	20
2	SODIUM COCOYL AMINOACIDS, POTASSIUM OLIVOYL/LAUROYL WHEAT AMINOACIDS, FRUCTOSE, AQUA (OLIVOIL FRUTTOSIDE - Kalichem Italia)	10
3	SODIUM COCOYL GLYCINATE, AQUA (SODIUM COCOYL GLYCINATE - Kalichem Italia)	10
4	SODIUM OLIVOYL GLUTAMATE, AQUA (OLIVOIL GLUTAMMATE - Kalichem Italia)	5
5	AQUA	50
6	XANTHAN GUM	1
7	GLYCERIN	4
		100.00

PRODUCT SPECIFICATION

INCI NAME and COMPOSITION	RANGE %
POTASSIUM OLIVOYL HYDROLYZED OAT PROTEIN	25% ≤ [%] < 50%
AQUA	50% ≤ [%] < 75%

PHYSICO - CHEMICAL ANALYSIS	METHOD	LIMITS
APPEARANCE	Internal	CLEAR LIQUID
COLOUR	Internal	STRAW COLOURED
ODOUR	Internal	SLIGHT TYPICAL
pH DIRECT	Potentiometric	6,8 ÷ 7,8
DRY RESIDUE	2 hours 105 °C	26 ÷ 30
TOTAL MICROBE COUNT	by inclusion Ph. Eur. 7.0	0 ÷ 100

SHELF LIFE : 12 months

STORAGE CONDITIONS: Keep in original containers well closed in a cool (minimum suggested temperature 14°C max 27°C), dry, well ventilated, dark and clean site.

BIODEGRADABILITY: readily biodegradable



COSMOS
ORGANIC

OLIVOIL AVENATE EMULSIFIER
OLIVOIL AVENATE SURFACTANT
OLIVOIL EMULSIFIER
OLIVOIL FRUTTOSIDE SURFACTANT
OLIVOIL GLUTAMATE EMULSIFIER
OLIVOIL GLUTAMATE SURFACTANT
OLIVOIL PCA
OLIVOIL SURFACTANT
POTASSIUM OLIVATE



OLIVOIL
AVENATE
SURFACTANT



Head Office and Production:

Via G.Pastore, 1 - 25082 Brescia - ITALY
Tel: +39.030.26.93.532 - Fax: +39.030.21.93.581
kalichem@kalichem.it

www.kalichem.it