

# OLIVOIL PRODUCTS



## ***OLIVOIL AVENATE SURFACTANT***

***NATURAL SURFACTANT  
OF VEGETAL ORIGIN "ECOCERT"  
(OAT PROTEINS)***

# OLIVOIL PRODUCTS

## “PEG-FREE” SURFACE TENSION MODIFIERS 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 as much as possible compatible with the physiology of skin and its annexes, without any adverse effect or allergic potential. Second, 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 vegetable origin are ethylene oxide free and highly performing in cosmetic formulations. Moreover, they provide to the skin the pleasant accompanying effects of vegetal structures. The OLIVOIL brand references are based on the multi-faceted combination of OLIVE OIL and vegetal PROTEINS, derived from WHEAT and OAT.

### THE ORIGINS



Extra-virgin **Olive** oil is obtained by cold pressing of the pulp of fruits of *Olea europaea* (Olive), a species of small tree 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 average composition, here given in comparison with the most used edible oils:

OILS	SATURATED LIPIDIC CHAINS	MONO-UNSATURATED LIPIDIC CHAINS	POLY-UNSATURATED LIPIDIC CHAINS
OLIVE OIL	16%	75%	9%
PEANUT OIL	19%	53%	28%
SUNFLOWER OIL	11%	33%	50%
CORN OIL	5%	31%	50%
SOYA OIL	4%	23%	59%
COCONUT OIL	87%	6%	2%

Widely preferred to other vegetable 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 of a millenary history of contact with vital human cells, which thus allows to boast high safety standards. When the complex of its

Head Office and Production:  
Via G. Pastore, 1  
25082 Botticino Sera (BS) ITALY  
Tel: +39.030.2693532  
Fax: +39.030.2193581  
e-mail: kalichem@kalichem.it  
www.kalichem.it

lipidic chains is chemically combined with hydrophilic molecules of known performances, functional ingredients suitable for innumerable cosmetics 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.

## **WHEAT AND OAT PROTEINS**

Once were animal proteins... Used as active ingredients of primary choice for most cosmetic formulators, they offered economical, functional molecules of acceptable colour and odour 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 vegetable 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 WHEAT PROTEINS



Naturally derived, hydrolyzed wheat proteins contain also wheat oligosaccharides (carbohydrates) and constitute a unique hydrating complex offering a combination of moisture-balancing and film-forming properties. They work synergistically to give better bounce to the hair, and smoother, softer feel to the skin. An exceptional ingredient to add moisturization to lotions, creams and serums, it is also an excellent additive for shampoos, conditioners and body washes.

### HYDROLYZED OAT PROTEINS

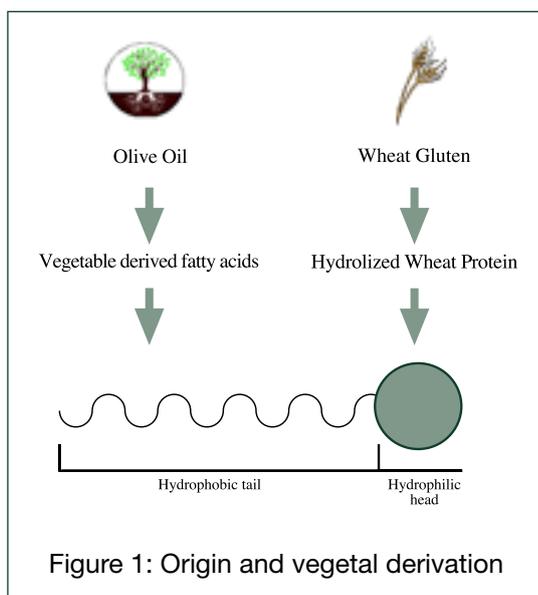


Oat is the only cereal containing a globulin or legume-like protein, avenalin, as the major (80%) storage protein. Globulins are characterized by their water solubility. Because of this property, oats flour may be turned into milk but not into bread. The minor protein of oat is a prolamine (typical cereal proteins such as gluten and 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 protein content 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 organisms (GMO).

## OLIVOIL TECHNOLOGY

Combining the best of both vegetal oils and protein sources allowed Kalichem to achieve new molecules having relevant interfacial properties (see fig. 1):



These new surface-active agents can be used to formulate 'totally natural' finished cosmetic products that are very suitable for sensitive skin, baby-care, hair-care and personal-hygiene. Furthermore, beside 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 of 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 S.r.l.
13. Technical file: Olivoil Avenate, By Kalichem Italia S.r.l.
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, Proserpio G, Rastrelli GB: "An Olive Oil- and Wheat-derived Lipoprotein Emulsifier" - C&T, 116 (2001) 8, 45-6.

# OLIVOIL AVENATE

## "PEG-FREE" SMOOTH SURFACTANT

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 oat proteins. Obtained through an environmentally friendly process, it is the eligible surfactant that significantly reduces the aggressive behaviour for the skin of traditional anionic surfactants. 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 selected as the main surfactant for the formulation of detergents for sensitive, very dry and atopic skins.

### **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 be also used as primary surfactant for very mild cleansing cosmetics. Furthermore, thanks to the hydrolyzed protein fraction and the beta-glucan content, it might act as functional ingredient, leading to skin benefits as moisturization, emollient, soothing and protective effects.

### **EVALUATION STUDY OF THE MILD PROPRIETIES OF THE OLIVOIL AVENATE SURFACTANT**

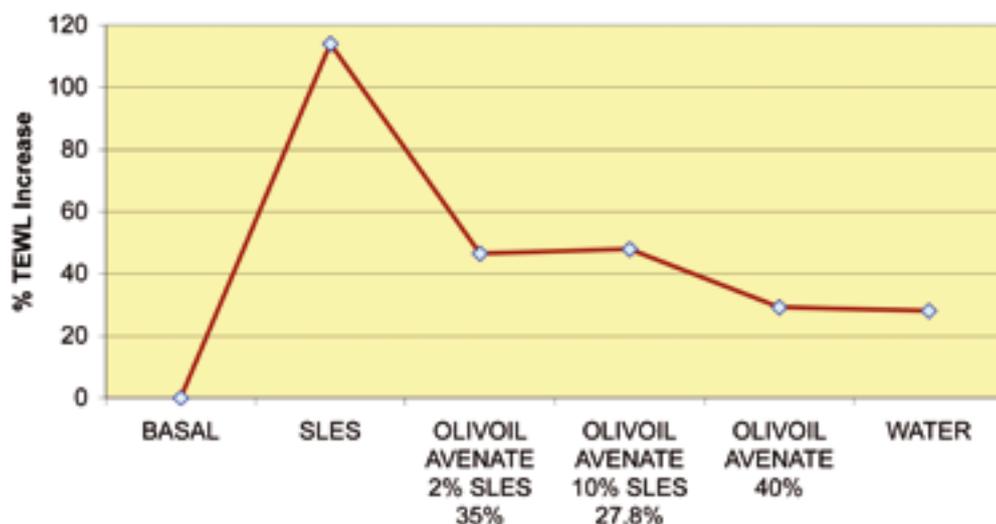
The aim of the study is to evaluate the proprieties concerned with the respect of the cutis integrity of three cleansing products containing Olivoil Surfactant through values of transepidermal water loss, pH and colourimetry.

The test TWEL (\*) values are summed up in the following diagram which shows the average TWEL 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 (L.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 of hydrolipidic film, show a significant lower TWEL 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 TWEL increase with respect to all other areas tested similar to the result obtained after washing with tap water.



The graphic shows the TEWL change %, that is the proprieties concerned with the cutis integrity of some cleansing products containing OLIVOIL AVENATE compared with SLES and 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 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 values 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/m<sup>2</sup>h, 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 carry out any aggressive activities against the skin structure and the integrity of the hydrolipidic film as it determines the same TEWL value obtained with tap water,
- 2) OLIVOIL AVENATE carries out a protective action on the skin against aggressive chemical surfactants,
- 3) OLIVOIL AVENATE carries out this protective action on the skin at low percentages (2%) as much as at higher ones (10%).

(\*) *The skin hydration depends on the integrity of the skin structure, namely on the integrity of the cherratine 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 (trasepidermal water loss), that is the quantity of water vapour released by the skin with time: a high value shows that the skin is loosing too much water and that it cannot retain it because of an alteration of the skin structure (hydrolipidic film and cherratine) 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 OLIVOIL PRODUCTS IN THE 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, palmitic 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 the fatty acid present in the molecule is made of.

These fatty acids of olive oil bond to wheat proteins have more similarities to both cutaneous secretion (sebum) and the cutaneous structures themselves (cheratine) making the Olivoil products very tolerable at cutaneous level and thus giving the finished products containing them a very nice psychoreologic effect.

The Olivoil products carry out an effective functional action, very soft and moisturizing, in the respect of a correct cutaneous physiology.

They leave on the skin a good feel of hydration, smoothness, softness and cleansing: 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 hydration, smoothness and softness wants to be additionally achieved. Moreover, the higher is the percentage of Olivoil used, the higher is the sensory eudermic effect obtained.

### OLIVOIL AVENATE - PRODUCT SPECIFICATION

INCI NAME and COMPOSITION:	CAS No	EINECS/ELINCS	Range %
Potassium Olivoyl Hydrolyzed Oat Protein	-	Biopolymer	25-30%
Aqua	7732-18-5	231-791-2	70-75%

PHYSICO - CHEMICAL ANALYSIS	METHOD	LIMITS
APPEARANCE:	Visual	CLEAR LIQUID
COLOUR:	Visual	CLEAR AMBER
ODOUR:	Sensorial	SLIGHT, CHARACTERISTIC
DRY RESIDUE:	Internal	24 - 28%
pH	Internal	6.8- 7.8
NITROGEN:	Kieldhal	2.2 - 2.8%
MICROBIOLOGICAL SPECIFICATION:	Internal	< 100 UFC/g

SHELF LIFE: 12 months in the original containers

#### APPLICATIONS

Between 3 and 40% in skin cleansing products (foam bath, shampoos, baby care and personal hygiene cosmetics).

*OLIVOIL AVENATE has obtained the ECOCERT certification (since Jan. 2008)*

RANGE PRODUCTS:

OLIVOIL EMULSIFIER

OLIVOIL SURFACTANT

OLIVOIL GLUTAMATE SURFACTANT

OLIVOIL AVENATE SURFACTANT

OLIVOIL PCA

