

fractionated cocontrol lipids functional active + luxurious sensorial experience antioxidant, film-forming, moisturizing, soothing

BACKGROUND

"First it was coconut milk, then coconut water, and now coconut oil—and I think a big part of the recent popularity is that it is natural, not synthetic, which is so appealing," says Francesca Fusco, MD, a dermatologist at Wexler Dermatology in NYC. Most commonly, cosmetic companies have incorporated coconut water into their lines hoping to capitalize on this trend. However, the truth is, topically applied coconut water, or milk, may not enhance moisturization or provide protection to the skin, scalp or hair.

Coconut oil is now making its mark in the personal care market as the more effective alternative to mineral oil. The combination of antioxidant, antiinflammatory, hydrating, and barrier protection properties make this oil definitively unique. Much like coconut oil, fractionated coconut lipids are composed of saturated fats and medium chained triglycerides ideal for reinforcing the skin's barrier, trapping water thus moisturizing the skin in addition to reducing inflammation.

SCIENCE

Active Concepts has selectively fractionated coconut lipids to create a multifuctional ingredient, **AcquaSeal**[®] **Coconut**. The key to restoring the skin's barrier function is normalizing the epidermal lipids. **AcquaSeal**[®] **Coconut** is ideal for this due to its high concentration of Medium Chain Triglycerides (MCTs), and non-estrogenic phytosterols. Unlike other triglycerides, MCTs are metabolized much more efficiently than Long Chain Triglycerides (LCTs). The result of this being laser-like attention focused on MCTs.

MCTs are more efficiently metabolized than LCTs because they are able to cross the double mitochondrial membrane rapidly and do not require carnitine in order to continue on the metabolic pathway.



Code Number: 20742

 INCI Name: Cocos Nucifera (Coconut) Fruit Extract
INCI Status: Conforms
REACH Status: Complies
CAS Number: 8001-31-8
EINECS Number: 232-282-8

Origin: Plant

Processing: **GMO** Free No Ethoxylation No Irradiation No Sulphonation Additives: Preservatives: None Antioxidants: None Other additives: Tocopherol Solvents Used: N/A Appearance: Opaque Paste Soluble/ Miscible: Oil Soluble **Ecological Information**: 86.65% Biodegradability Microbial Count: <100 CFU/g, No Pathogens

Suggested Use Levels: 0.5 - 5.0% Suggested Applications: Improves Barrier Function, Moisturizes, Film-Forming, Enhances Product Feel, Sensorial, Antioxidant, Reduces Transepidermal Water Loss

Benefits of AcquaSeal® Coconut:

- Enhances Aesthetics of Final Formulas
- Intense Moisturizing Benefits
- Perceivable Sensorial Attributes
- Improved Barrier Function
- Antioxidant Protection



This quick metabolic conversion of MCTs into cellular energy increases the absorption of vitamins, minerals, and amino acids. Additionally, the eventual conversion of MCTs into essential fatty acids allows for normalization of the epidermal lipids. Application of **AcquaSeal® Coconut** demonstrates the utility of this approach via rapid and efficacious hydration.

BENEFITS

As a multifunctional ingredient, **AcquaSeal® Coconut** endows the skin and hair with a silky texture sans the feel of an oily or greasy residue. When incorporated in personal care products, **AcquaSeal® Coconut** seals in moisture and delivers critical macronutrients. By implementing the coconut's hydration retention strategy into skin and hair care formulations, we can capitalize on the undeniable and immediately perceivable benefits such as reduction in transepidermal water loss, intense moisturization, and the sensorial experience that accompanies **AcquaSeal® Coconut** as it assimilates with the skin transforming it into a luxuriously soft, hydrated surface.

EFFICACY DATA

To demonstrate decreased Transepidermal Water Loss and the increase in skin moisturization, Active Concepts conducted a three week study in which an untreated control, a base lotion (Cetaphil Moisturizing Lotion for All Skin Types), and a test lotion (2.0% **AcquaSeal**® **Coconut** + Base Lotion) were evaluated. Ten (M/F) panelists between the ages of 23 - 45 were asked to apply the materials specified to sites on their volar forearms, twice daily. Initial and weekly measurements were taken using the DermaLab Corneometer. Following the base line readings, measurements were recorded again after 24 hours, one week, two weeks, and three weeks. When compared to the base lotion, **AcquaSeal**® **Coconut** was shown to decrease Transepidermal Water Loss by 6.0% better than the base lotion after 24 hours and 15.0% better than the base lotion after three weeks. In comparison, the untreated site, the test lotion (2.0% **AcquaSeal**® **Coconut** + Base Lotion), decreased TEWL 19.0% better at the end of three weeks. Results indicate that **AcquaSeal**® **Coconut** is capable of reducing TEWL, promoting moisture retention.



Decrease in Transepidermal Water Loss

Figure 1. Percent decrease in TEWL when using **AcquaSeal® Coconut** and the base lotion compared to the untreated control.



Another *in-vivo* study was conducted over the course of three weeks to evaluate **AcquaSeal® Coconut**'s ability to increase moisturization. Ten (M/F) subjects between the ages of 23 - 45 participated in the study. A DermaLab Corneometer was used to measure the moisture levels on the subject's volar forearms. The Corneometer is an instrument that measure the amount of water within the skin. Baseline measurements were taken on day one of the study. Following initial measurements, all subjects were to apply 2 mg of the positive control and test material to the denoted area on their respective forearms, twice a day for three weeks. The test material consisted of 2.0% AcquaSeal® Coconut + Base Lotion and the positive control (base lotion) used was Cetaphil Moisturizing Lotion for All Skin Types. After 24 hours, the test material increased skin moisturization by 161.0% and increased moisturization by 129.0% when the site was measure again at the end of three weeks.



Increase in Moisturization

A half head study was conducted to determine the comparison of a control shampoo vs. 2.0% AcquaSeal[®] Coconut in a Base Shampoo. Additionally, a comparison between the control conditioner and 2.0% AcquaSeal[®] Coconut in a Base Conditioner was reported. The images of the half head study were used in conjunction with a sensory assessment subjectively rating shine, volume, dry and wet combability, thickness, smoothness, hydration, softness and manageability. This assessment was conducted both before and after treatment. Based on the results obtained, AcquaSeal[®] Coconut is capable of enhancing the shine, smoothness, moisture levels, and overall health and manageability of the hair, making it an ideal ingredient for use in products intended for unruly or ethnic hair types.



Figure 3. Full head Baseline, Untreated Hair



Figure 4. Half Head Treated



An *in-vitro* ORAC Assay was conducted to evaluate **AcquaSeal® Coconut's** ability to reduce oxidative stress. This assay is based upon the effect of peroxyl radicals generated from the thermal decomposition of 2,2'-azobis-2-methylpropanimidamide dihydrochloride on the signal intensity from the fluorescent probe, fluorescein, in the presence of an oxygen radical absorbing substance. Results indicate that the product provides intense protection against Reactive Oxygen species comparable to Trolox, an analogue of Vitamin E.



ORAC Assay of AcquaSeal[®] Coconut

Figure 5. Antioxidant capacity of AcquaSeal® Coconut

A study was conducted to determine the relative hydration potential of several materials which exhibit moisturizing properties through their respective water holding capacities. The study demonstrates the hydration potential of **AcquaSeal® Coconut** in comparison to some of its natural, synthetic, and animal-derived competitors. The results indicate **AcquaSeal® Coconut** is an excellent all natural and botanical alternative to Lanolin as it is capable of holding 200% of its weight in water.



Hydration Potential of AcquaSeal® Coconut

An *in-vivo* pollution protection assay was conducted to assess the ability of **AcquaSeal® Coconut** to provide immediate protection from carbon air pollution. **AcquaSeal® Coconut** was applied to the skin and then contaminated with a premeasured amount of activated charcoal (> 2.5µm size particles). It was then washed using a controlled amount of water in order to quantify **AcquaSeal® Coconut's** ability to inhibit these particles from remaining on the skin. These results indicate **AcquaSeal® Coconut** was able to provide pollution protection as specified by micronized carbon residue. It can therefore be concluded that at normal use concentrations **AcquaSeal® Coconut** can be used as a skin pollution protection active ingredient.



Figure 7. AcquaSeal® Coconut pre-wash



Figure 9. Untreated control pre-wash



Figure 8.AcquaSeal® Coconut post-wash



Figure 10. Untreated control post-wash

References

- 1) St-Onge MP, et al. Greater rise in fat oxidation with medium-chain triglyceride consumption relative to long-chain triglyceride is associated with lower initial body weight and greater loss of subcutaneous adipose tissue, Intl J of Obesity & Related Metabolic Disorders, 2003 Dec;27(12):1565-71.
- 2) Prior IA, et al. Cholesterol, coconuts, and diet on Polynesian atolls: The Pukapuka & Tokelau Is studies, Amer J of Clinical Nutrition, 198; 34:1552-1561.



Active Concepts, LLC Lincolnton, NC. USA www. activeconceptsllc.com Office: +1 (704) 276 7100 info@activeconceptsllc.com Active Concepts S.r.l. Milano ITALY www.activeconcepts.it Tel +39 02 90360719 info@activeconcepts.it Active Concepts LLC, Asia Kaohsiung, Taiwan www.activeconceptsllc.com Tel + 886 73599900 info@activeconceptsllc.com.tw

Information contained in this technical literature is believed to be accurate and is offered in good faith for the benefit of the customer. The company, however, cannot assume any liability or risk involved in the use of its chemical products since the conditions of use are beyond our control. Statements concerning the possible use of our products are not intended as recommendations to use our products in the infringement of any patent. We make no warranty of any kind, expressed or implied, other than that the material conforms to the applicable trandard specification. Freedom from patent infringement is on timplied. All information is for investigative purposes only.

