

# AcquaSeal® Coconut



fractionated coconut 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’s 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, does 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, anti-inflammatory, 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 multifunctional 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:** Botanical

**Processing:**

GMO Free

No Ethoxylation

No Irradiation

No Sulphonation

**Additives:**

Preservatives: None

Antioxidants: None

Other additives: None

**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

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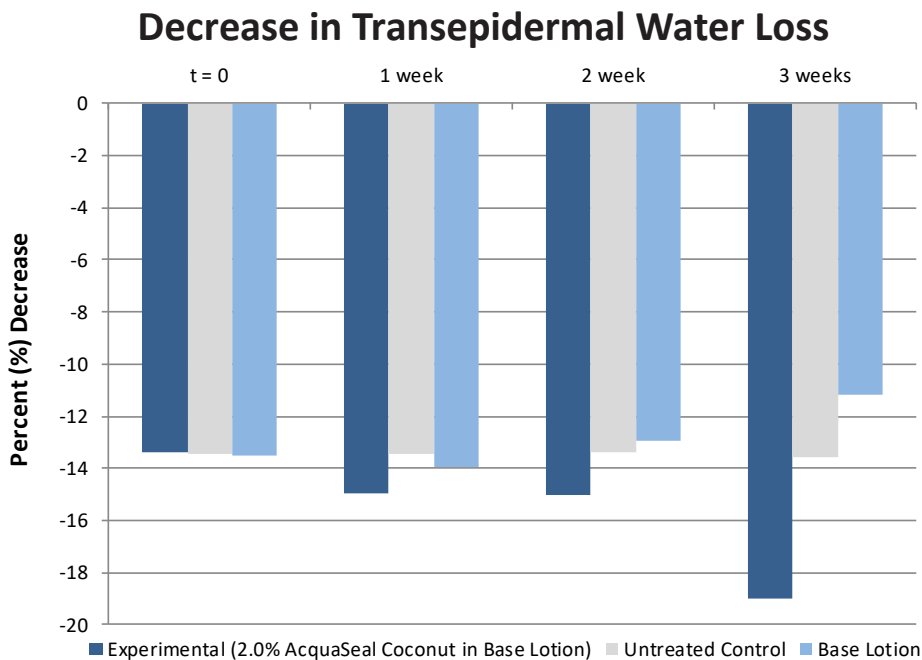
This quick metabolic conversion of MCTs into cellular energy increases the absorption of vitamins, minerals, and amino acids. Additionally, the eventual conversion of MCTs into essential fatty acids allows for normalization of the epidermal lipids. Application of **AcquaSeal® Coconut** demonstrates the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

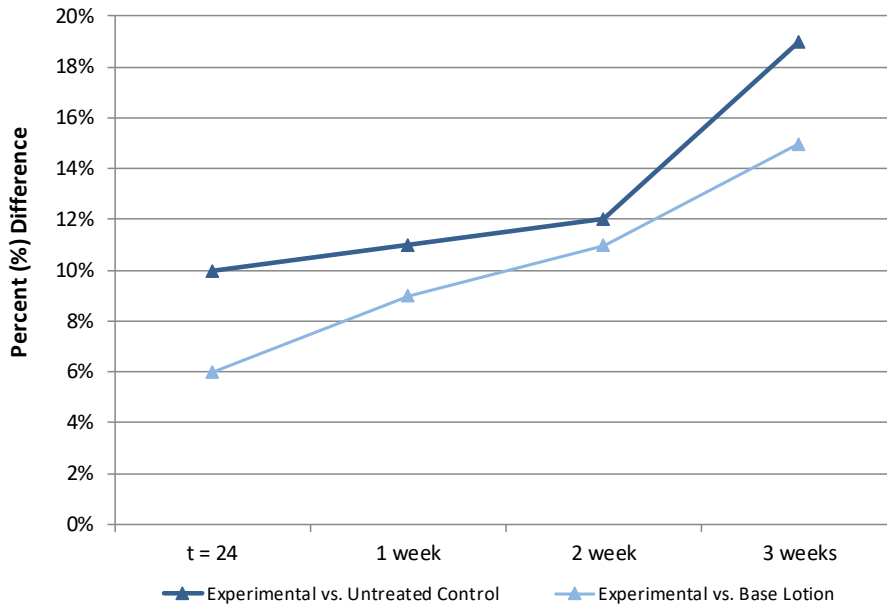
To demonstrate decreased Transepidermal Water Loss and the increase in skin moisturization, Active Concepts conducted a three week study in which an untreated control, a base lotion (Cetaphil Moisturizing Lotion for All Skin Types), and a test lotion (2.0% **AcquaSeal® Coconut** + Base Lotion) were evaluated. 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.



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

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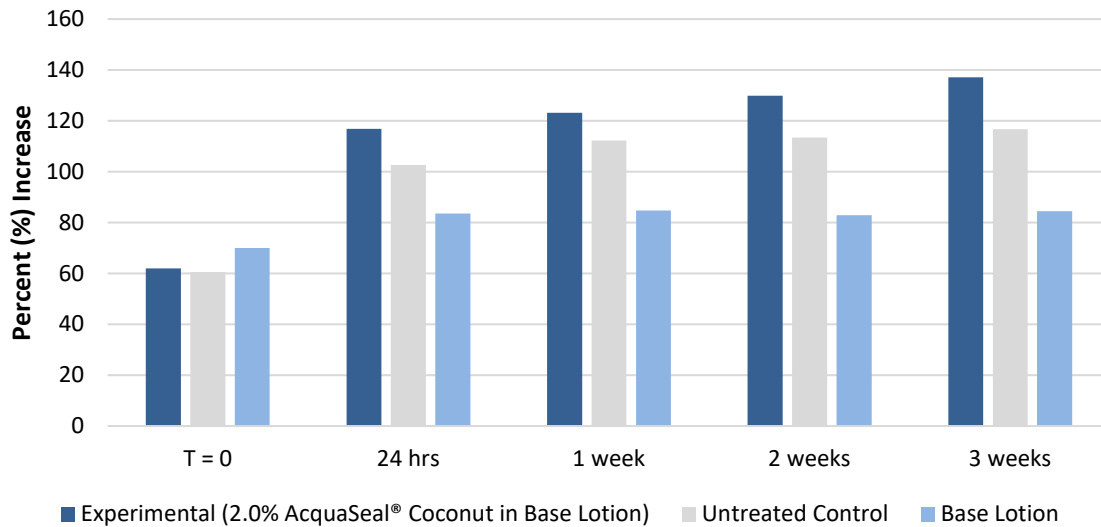
## Transepidermal Water Loss Comparison



**Figure 2.** Percent TEWL reduction comparing **AcquaSeal® Coconut** in a base lotion vs. the base lotion.

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.

## Increase in Moisturization

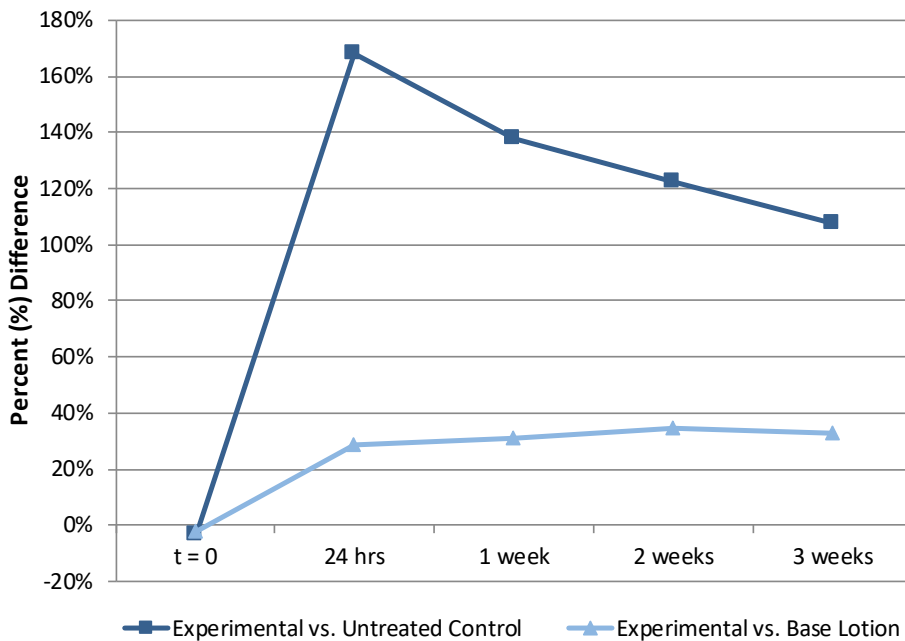


**Figure 3.** Percent increase in skin moisturization as measured on three test sites.

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. After 24 hours, the base lotion only increased skin moisturization by 125.0% and by a less impressive 90.0% at the end of three weeks.

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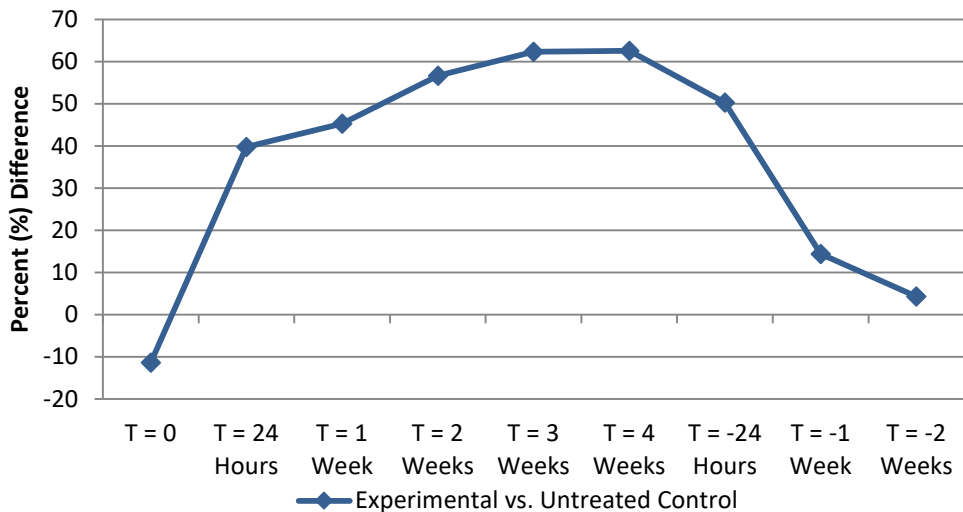
## Moisturization Comparison Between Sites



**Figure 4.** Percent difference in moisturization between test sites.

When compared to the untreated site after 24 hours, the test material (2.0% **AcquaSeal® Coconut** + Base Lotion) moisturized the skin 168.0% better. After three weeks, the test material (2.0% **AcquaSeal® Coconut** + Base Lotion) was 108.0% more effective in moisturizing the skin than no treatment at all. When evaluated after 24 hours, the test material (2.0% **AcquaSeal® Coconut** + Base Lotion) site was 29.0% more moisturized than the positive control site. After three weeks, the test material still yielded impressive results proving to be on average 33.0% more effective in moisturizing the skin than the base lotion alone.

## Moisture Regression Experimental Treatment vs. Untreated



**Figure 5.** Moisture Regression.

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Furthermore, when examining the moisture levels on the skin after application of test materials stopped, it was determined that **AcquaSeal® Coconut** is capable of sustaining increased skin moisturization when compared to the skin site that remained untreated through the duration of the study. After 24 hours, the site testing 2.0% **AcquaSeal® Coconut** + Base Lotion was approximately 56.70% more moisturized than the site which received no treatment. After one week, the experimental test site was still yielding moisturization results that were 65.88% better than the untreated site. Additionally, in comparison to the site tested with the base lotion alone, the site treated with 2.0% **AcquaSeal® Coconut** + Base Lotion moisturized the skin 25.10% better after 24 hours and was still 28.38% more effective in moisturizing the skin when reading were taken one week after the applications of both test materials

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 6.** Full head Baseline, Untreated Hair



**Figure 7.** Half Head Treated



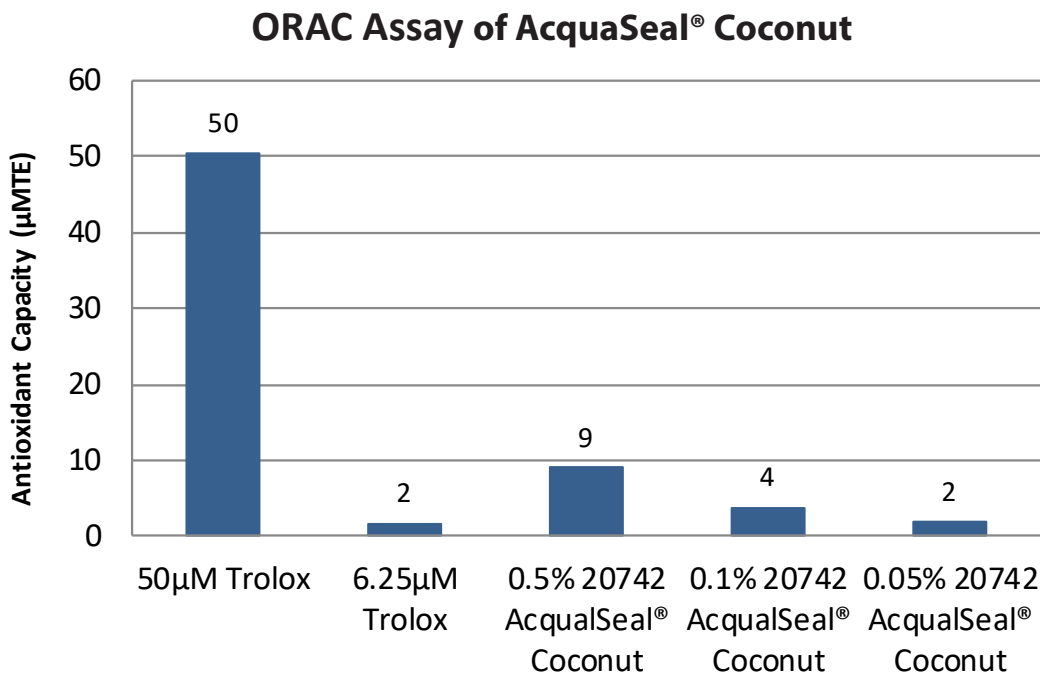
**Figure 8.** Full head Baseline, Untreated Hair



**Figure 9.** Half Head Treated

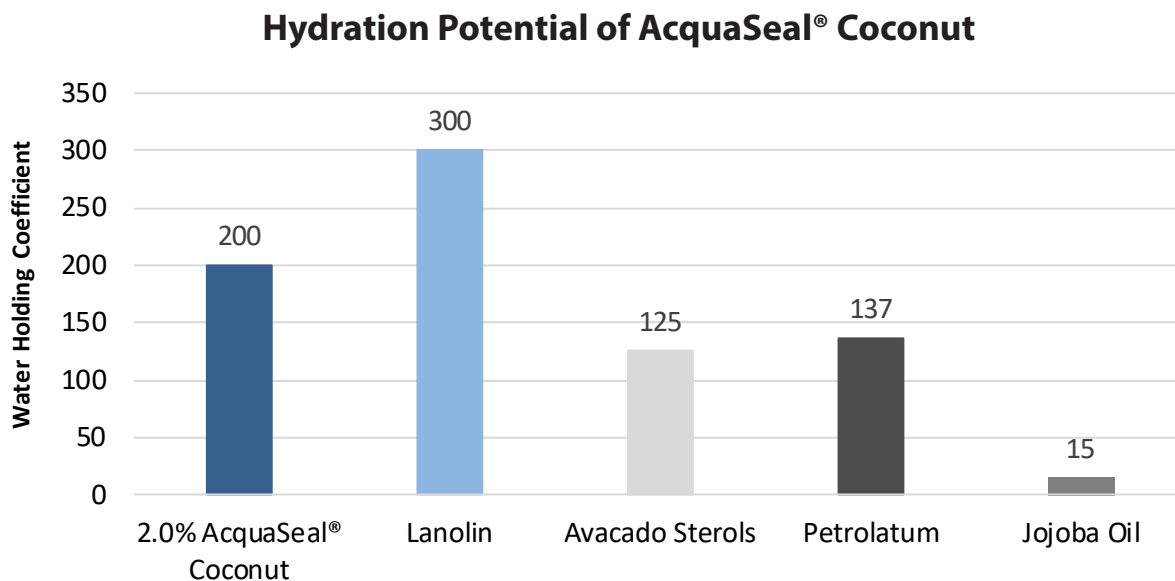
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An ORAC Assay was conducted to evaluate **AcquaSeal® Coconut's** ability to reduce oxidative stress. This assay is based upon the effect of peroxy radicals generated from the thermal decomposition of 2,2'-azobis-2-methylpropanimidamide dihydrochloride 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.



**Figure 10.** 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.



**Figure 11.** Hydration potential of **AcquaSeal® Coconut**



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A 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.

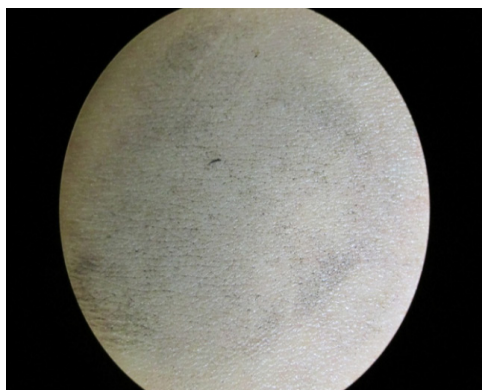


Figure 12. AcquaSeal® Coconut pre-wash



Figure 13. AcquaSeal® Coconut post-wash

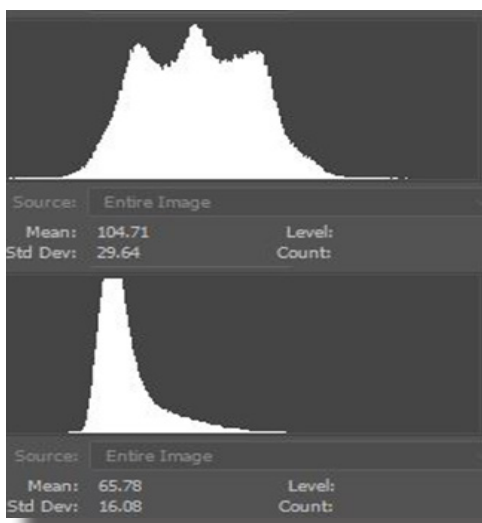


Figure 14. AcquaSeal® Coconut Histograms

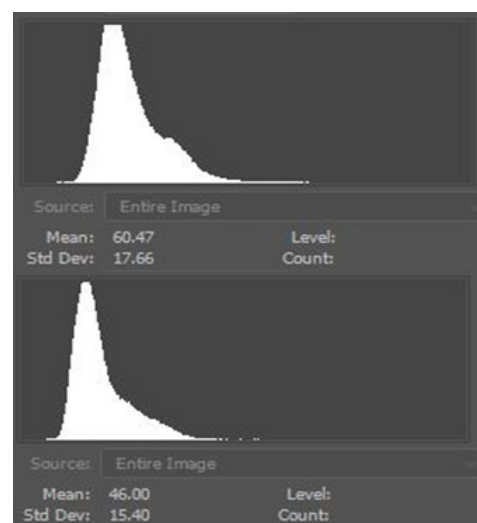


Figure 15. Untreated Histograms

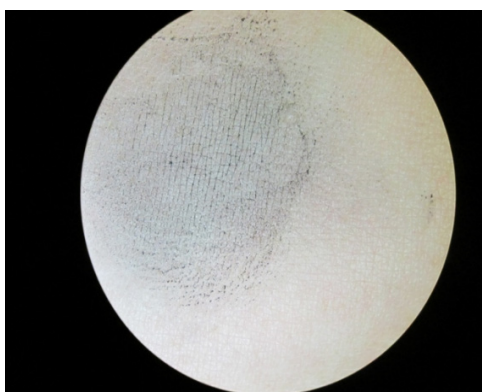


Figure 16. Untreated control pre-wash

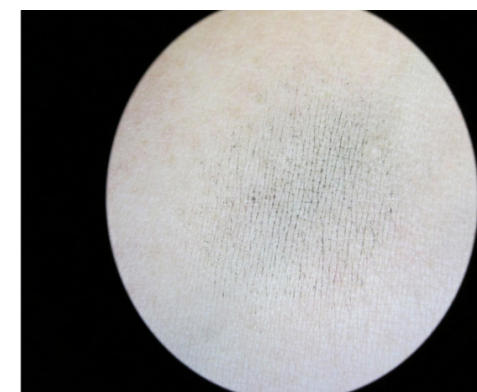


Figure 17. Untreated control post-wash

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## DISCUSSION

Results indicate that **AcquaSeal® Coconut** is capable of reducing TEWL, increasing moisture levels, thus enhancing the overall health and integrity of the skin both initially and overtime at low levels in a base lotion. **AcquaSeal® Coconut** is also capable of providing pollution protection and antioxidant protection. A great combination for keeping skin healthy and vibrant. **AcquaSeal® Coconut** also provides various benefits in hair care application to offer a product that is versatile in a variety of personal care applications. Tropical and Topical, coconut is one of the most rapidly growing memes in the consumer market. By coupling consumer perception with proven efficacy and superior texture, **AcquaSeal® Coconut** is an effective answer to the demanding personal care and cosmetic market.

## 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.



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