

**Tradename:** ABS Rice Lipids Plus

**Code:** 10350

**CAS #:** 8016-60-2

**Test Request Form #:** 1766

**Lot #:** 44655P

**Sponsor:** *Active Concepts, LLC; 107 Technology Drive Lincolnton, NC 28092*

**Study Director:** *Maureen Drumwright*

**Principle Investigator:** *Jennifer Goodman*

**Test Performed:**

Transepidermal Water Loss (TEWL) Assay

**Introduction**

Transepidermal water loss occurs when water passes from the dermis through the epidermis and evaporates from the skin's surface. When TEWL levels are high, the skin will often feel dry, flaky, and rough. Moisture retention is vital to the skin barrier by keeping skin moisturized and hydrated. Protecting skin from excessive TEWL will lead to a healthier and more youthful skin appearance.

The Transepidermal Water Loss Assay was conducted to assess the moisture retention capabilities of **ABS Rice Lipids Plus**.

**Assay Principle**

Transepidermal water loss is measured by the DermaLab Combo based on Nilsson's Vapor Pressure Gradient method. This method involves an open chamber with minimal impact on the skin, and therefore, a very low bias. Two temperature and humidity sensor sets are mounted in a chamber at different heights above the surface of the skin. The evaporation rate of the skin follows Fick's Law of Diffusion:

$$\text{Rate} = P \times [c_1 - c_2] / T$$

Where P = permeability coefficient of membrane, (c1-c2) = concentration gradient, and T = thickness of membrane).

**Materials**

**A. Equipment:** DermaLab Skin Combo (Transepidermal Water Loss Probe)

**Methods**

20 M/F volunteers who were known to be free of any skin pathologies participated in this study. A DermaLab Combo was used to measure TEWL on the subject's volar forearms.

The instrument consists of a probe that is based upon the vapor gradient with an open chamber. This open chamber design maintains the free natural evaporation from the skin without interfering with the environment over the measurement area.

The instrument consists of a probe that is based upon the vapor gradient with an open chamber. This open chamber design maintains the free natural evaporation from the skin without interfering with the environment over the measurement area. This ensures unbiased and accurate readings. Operation of the water loss module is fully menu drive, allowing for pre-setting and standard deviation or measurement time. Baseline TEWL readings were taken at the start of the study.

Following initial measurements, all subjects were asked to apply 0.2 g of each test material on their volar forearms twice a day for a four-week period. Measurements were taken weekly over the course of four weeks. The test material consisted of 2.0% **ABS Rice Lipids Plus** in a base lotion.

For added perspective, measurements of an untreated test site and a site treated with a base lotion (Cetaphil Moisturizing for All Skin Types) were recorded.

## Results

**ABS Rice Lipids Plus** showed very effective moisture retention capabilities at a 2.0% concentration. Please note each value is an average of three consecutive readings per test site.

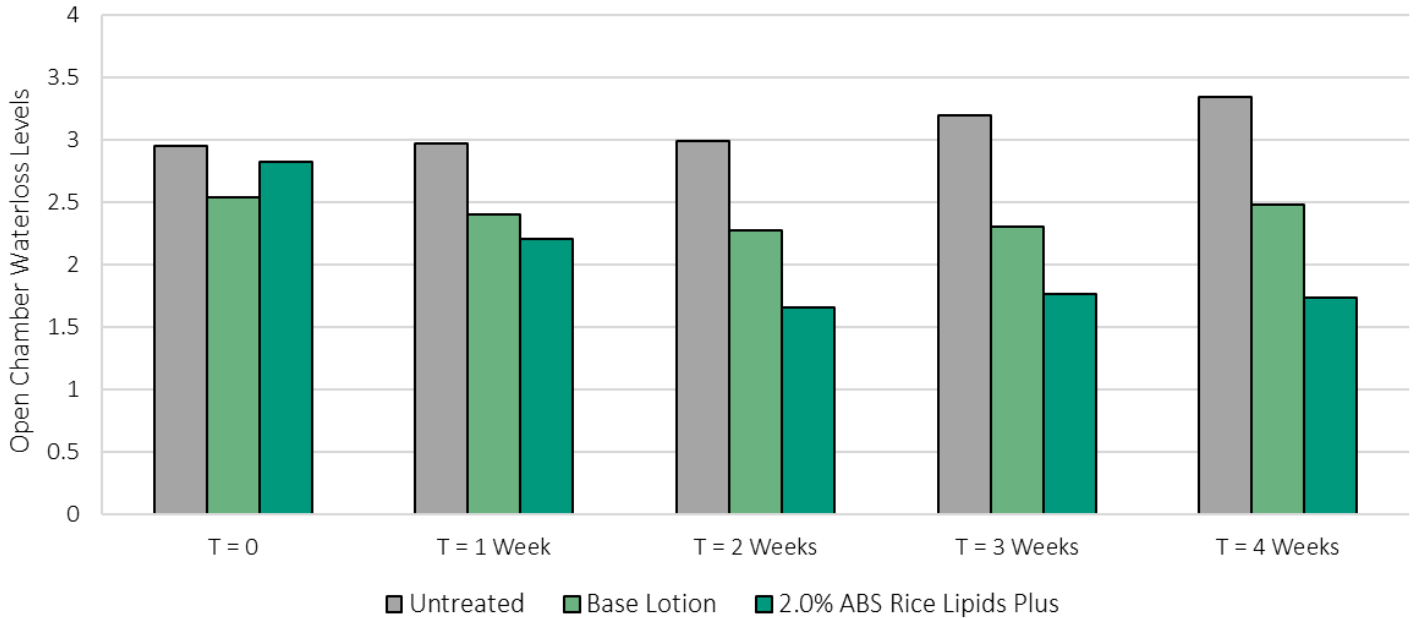
Percent change in TEWL is calculated by the following formula:

$$\text{Percent (\%) Change} = \frac{\text{Average TEWL Value}_{T=24 \text{ hours.etc}} - \text{Average Baseline Value}_{T=0}}{\text{Average Baseline Value}_{T=0}} \times 100$$

**Table 1.** Difference in Transepidermal Water Loss Results Between Test Sites at Each Time

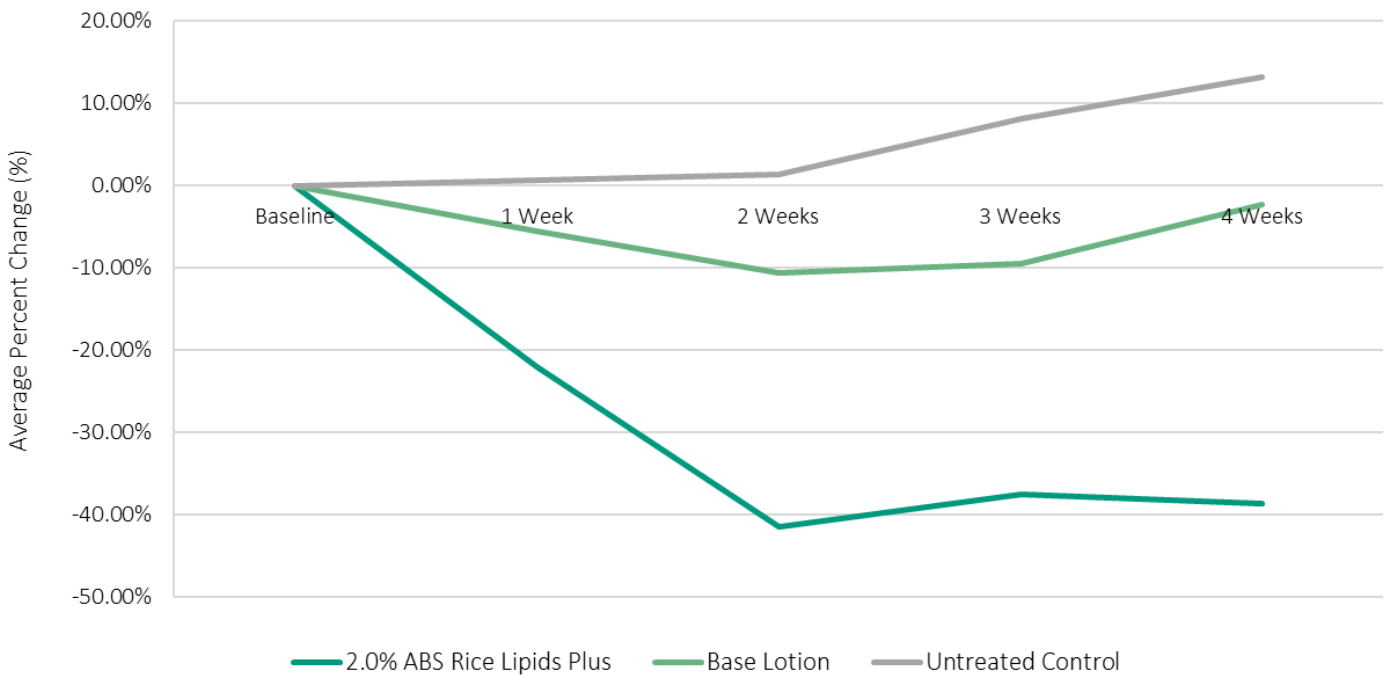
Percent (%) Difference	T = 0	T = 1 Week	T = 2 Weeks	T = 3 Weeks	T = 4 Weeks
Experimental (2.0% ABS Rice Lipids Plus + Base Lotion) vs Base Lotion	10	9	32	27	36
Experimental (2.0% ABS Rice Lipids Plus + Base Lotion) vs Untreated Control	5	30	58	58	64
Base vs Untreated Control	15	21	27	32	30

## Transepidermal Water Loss ABS Rice Lipids Plus



**Figure 1.** TEWL Measurements Taken at Individual Test Sites

## Change in Transepidermal Water Loss ABS Rice Lipids Plus



**Figure 2.** Percent Change in Transepidermal Water Loss of Each Time Point Compared to Baseline

**Table 2.** T-test Analysis of the TEWL Percent Difference (%) Between 2.0% **ABS Rice Lipids Plus** and Base Lotion at T= 2 Weeks (n=20,  $\alpha=0.05$ , df=28)

	ABS Rice Lipids Plus	Base Lotion
Mean	1.67	2.27
Variance	1.19	0.395
t Stat	-2.056	
P(T<=t) two-tail	0.0492	
t Critical two-tail	2.048	

**Table 3.** T-test Analysis of the TEWL Percent Difference (%) Between 2.0% **ABS Rice Lipids Plus** and Base Lotion at T= 4 Weeks (n=20,  $\alpha=0.05$ , df=37)

	ABS Rice Lipids Plus	Base Lotion
Mean	1.77	2.48
Variance	0.564	0.637
t Stat	-2.846	
P(T<=t) two-tail	0.00716	
t Critical two-tail	2.0261	

## Discussion

As evidenced in a four-week efficacy study of 2.0% **ABS Rice Lipids Plus** on the skin, it can be used to effectively reduce transepidermal water loss with better results over time. When compared to the base lotion and untreated control, 2.0% **ABS Rice Lipids Plus** had lower transepidermal water loss values by 36% and by 64%, respectively, after 4 weeks (Figure 1; Table 1). After 4 weeks, 2.0% **ABS Rice Lipids Plus** reduced transepidermal water loss by 39%, while the base lotion alone only reduced values by 2% when compared to the baseline levels (Figure 2; Tables 2, 3). Results indicate that **ABS Rice Lipids Plus** in a lotion formulation is capable of reducing transepidermal water loss to a greater degree when compared to the base lotion and untreated sites alone.

With the present study, we can confirm that **ABS Rice Lipids Plus** is capable of providing moisture retention benefits when added to personal care applications at recommended use levels. In conclusion, utilizing **ABS Rice Lipids Plus** improves skin health, appearance, and feel by improving moisture retention.

## References

1. Sharma AN, Patel BC. Laser Fitzpatrick Skin Type Recommendations. [Updated 2022 Mar 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK557626/>