Transepidermal Water Loss Study

ACTIVE CONCEPTS LLC
107 Technology Drive, Lincolnton | NC 28092 USA
• info@activeconceptsllc.com • Phone: +1-704-276-7100 • Fax: +1-704-276-7101 • https://activeconceptsllc.com/

Tradename: AC Vegetable Ceramides G

Code: 16558G

CAS #: 56-81-5 & 308067-30-3

Test Request Form #: 10777

Lot #: 9395464

Sponsor: *Active Concepts, LLC; 107 Technology Drive Lincolnton, NC 28092*
Study Director: *Maureen Drumwright*
Principal Investigator: *Kayla Patterson*

Test Performed:
Transepidermal Water Loss (TEWL) Study

Introduction
As the largest human organ, the skin's integrity is critical to properly function as a physical barrier and maintenance of a heathy appearance for aesthetics. Moisture retention is a fundamental component to the preservation of the skin's protective barrier function. Transepidermal water loss (TEWL) is the passive evaporation of water across the stratum corneum to the external environment because of the water vapor pressure gradient on both sides of the skin barrier. In healthy skin, TEWL is inversely proportional to skin hydration (i.e., decreased TEWL indicates properly hydrated skin). However, when the skin's protective barrier is compromised, TEWL levels are high and the skin feels dry, flaky, and rough. High TEWL levels, and reduced skin hydration, are correlated with skin aging and seen in many skin diseases. Consequently, moderating excessive TEWL improves the skin's protective barrier function and contributes to the appearance of healthier looking skin.

Accordingly, a transepidermal water loss study was conducted to evaluate the moisture retention properties of **AC Vegetable Ceramides G**.

Study Principle
TEWL measurements are made by placing a probe on the skin of preidentified test sites. By assessing changes in local humidity above ambient values the TEWL probe measures changes in water vapor density in a defined area over time. The controls and test materials are applied to the skin test sites twice a day and TEWL is measured weekly.

Materials
A. **Equipment:** DermaLab Skin Combo (Transepidermal Water Loss Probe)
B. **Products**: Base Lotion (Cetaphil® Moisturizing Cream for All Skin Types)

ACTIVE CONCEPTS LLC
107 Technology Drive, Lincolnton | NC 28092 USA
• info@activeconceptsllc.com • Phone: +1-704-276-7100 • Fax: +1-704-276-7101 • https://activeconceptsllc.com/

Methods

Volunteers between the ages of 22 and 40, who were known to be free of any skin pathologies participated in this study.

Four randomly assigned test sites were identified on the volar forearm of participants and baseline TEWL measurements were recorded. Following baseline measurements, participants applied 0.2 g of each test material on their volar forearms twice a day for four weeks. TEWL measurements were recorded once a week for four weeks. The skin test site conditions and treatments are described below (Table 2). The Base Lotion utilized in this study was Cetaphil® Moisturizing Cream for All Skin Types.

Table 1. Descriptions of the Conditions and Treatments for each Skin Test Site

Skin Test Site	Condition	Treatment / Test Article Application Description
1	Untreated Control	None
2	Base Lotion	Base Lotion
3	2.0% **AC Vegetable Ceramides G**	2.0% **AC Vegetable Ceramides G** in Base Lotion

An average of three consecutive TEWL measurements per condition at each time point was recorded and expressed as $g/m^2/h$. The percent change in TEWL values was calculated for each test site at every timepoint relative to Baseline values, using the following equation:

$$Percent\ Change\ (\%) = \frac{TEWL_{Week} - TEWL_{Baseline}}{TEWL_{Baseline}} \times 100$$

Results

The data obtained from this study met criteria for a valid study as the Untreated Control and Base Lotion performed as anticipated. Application of 2.0% **AC Vegetable Ceramides G** twice a day for four weeks demonstrated effective moisture retention properties by reducing TEWL throughout the study duration.

ACTIVE CONCEPTS LLC
107 Technology Drive, Lincolnton | NC 28092 USA
• info@activeconceptsllc.com • Phone: +1-704-276-7100 • Fax: +1-704-276-7101 • https://activeconceptsllc.com/

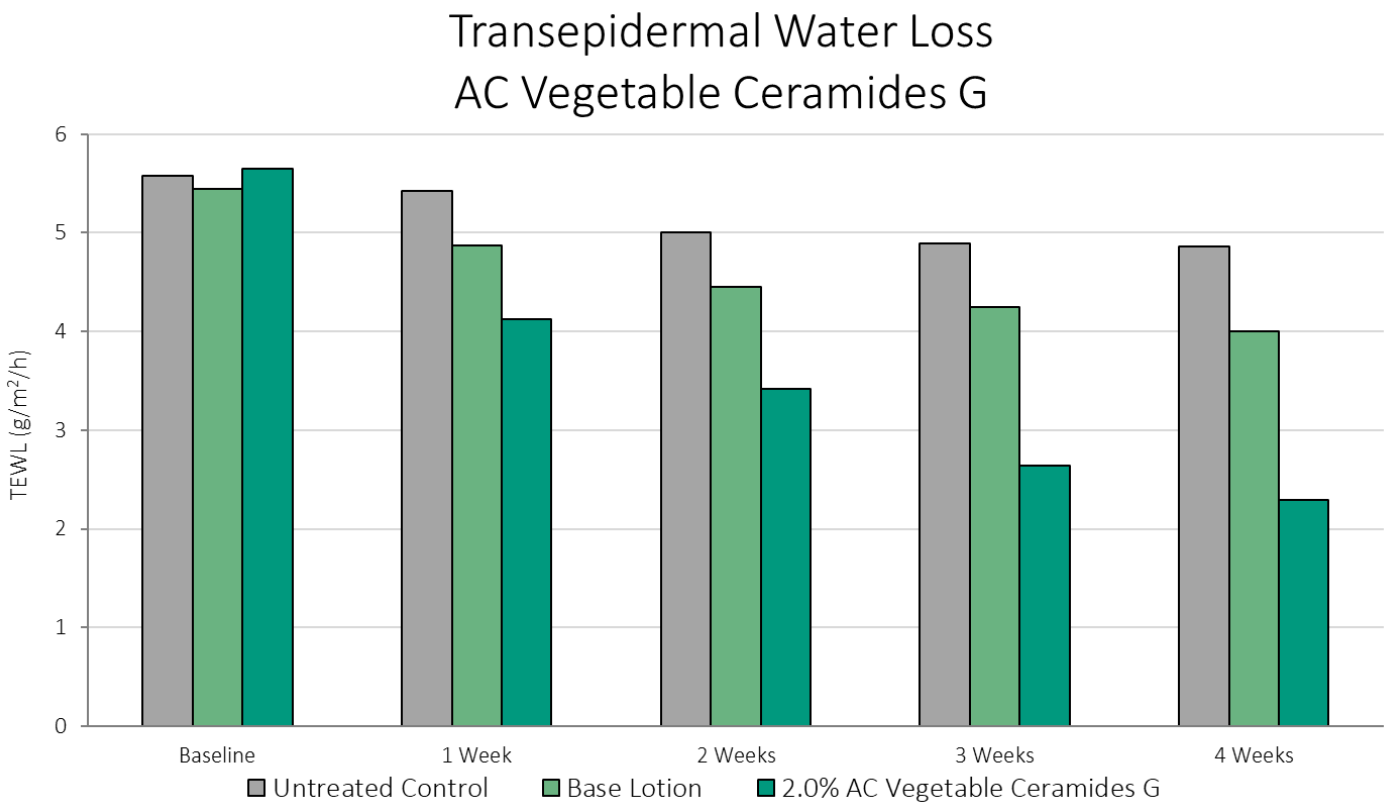

Figure 1. TEWL Measurements Overtime

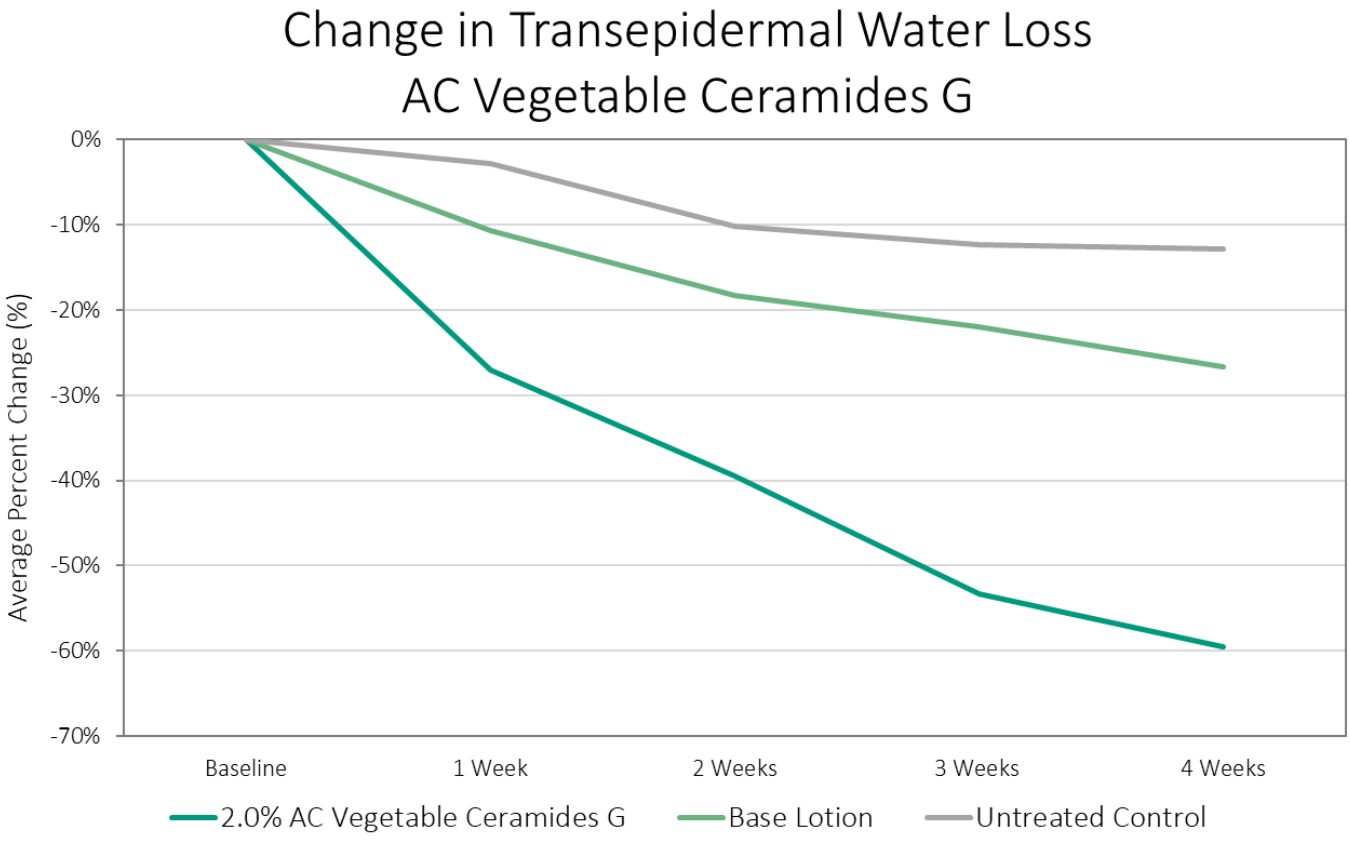

Figure 2. Percent Change in Transepidermal Water Loss Relative to Baseline Values

ACTIVE CONCEPTS LLC
107 Technology Drive, Lincolnton | NC 28092 USA
• info@activeconceptsllc.com • Phone: +1-704-276-7100 • Fax: +1-704-276-7101 • https://activeconceptsllc.com/

Discussion

The ability of **AC Vegetable Ceramides G** to retain skin moisture was assessed via TEWL throughout four weeks of twice daily application. As shown in Figure 1 and 2, TEWL did not significantly change throughout the study with the Untreated Control test site, indicating consistent skin moisturization throughout the four weeks. Similarly, TEWL was not significantly altered throughout the study with Base Lotion application, indicating the Base Lotion does not exert significant moisture retention on the skin (Figures 1, 2). Conversely, applying 2.0% **AC Vegetable Ceramides G** twice a day for four weeks reduced TEWL by 60% (Figures 1, 2). These results demonstrate **AC Vegetable Ceramides G** has effective moisture retention properties.

Similar results are shown when examining the collective effect of each condition. There is no difference in TEWL between the Untreated Control and Base Lotion after four weeks (Figure 1). However, applying 2.0% **AC Vegetable Ceramides G** significantly reduced TEWL compared to the Untreated Control and Base Lotion (Figure 1). These results demonstrate **AC Vegetable Ceramides G** elicits moisture retention in the skin with repeated applications.

Taken together, these results indicate **AC Vegetable Ceramides G** reduces TEWL when added to personal care applications at recommended use levels. Collectively, **AC Vegetable Ceramides G** demonstrates moisture retention properties which improves the skin's protective barrier function and contributes to the appearance of healthier looking skin.