Moisturization Study

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Tradename: AC LumiVitis

Code: 21032

CAS #: 8013-01-2 & 85594-37-2 (or) 84929-27-1 & 68333-16-4 (or) 1686112-36-6 (or) 9015-54-7

Test Request Form #: 14119

Lot #: 9418748

Sponsor: *Active Concepts, LLC; 107 Technology Drive Lincolnton, NC 28092*
Study Director: *Daniel Shill*
Principal Investigator: *Kayla Goodson*

Test Performed:
Moisturization Study

Introduction

The skin's structural and functional integrity is predominantly dependent on sufficient hydration levels given several enzymes maintaining homeostasis within the stratum corneum are hydrolytic and do not occur efficiently if water is below an acceptable threshold. Adequately hydrated skin is flexible, resistant to shearing forces, an effective protective barrier, and appears more youthful with a reduction in fine lines and wrinkles. Conversely, insufficiently hydrated skin is present in many skin diseases and exhibits a compromised protective barrier, feels dry, flaky, and rough, and is correlated with skin aging. Consequently, proper hydration maintains the skin's structural and functional integrity and contributes to the appearance of healthier looking skin.

Accordingly, a moisturization study was conducted to evaluate the skin hydrating properties of **AC LumiVitis.**

Study Principle

Hydration measurements are made by placing a probe on the skin of preidentified test sites. The hydration probe evaluates conductance properties by alternating voltages in the upper layers of skin and provides a measurement of local hydration. The controls and test materials are applied to the skin test sites twice a day and hydration is measured weekly.

Materials

A. **Equipment:** DermaLab Skin Combo (Hydration Probe)
B. **Products**: Base Lotion (Cetaphil® Moisturizing Cream for All Skin Types)
C. **Software:** Excel Analysis ToolPak (Microsoft)

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Methods

20 volunteers between the ages of 22 and 56, who were known to be free of any skin pathologies with Fitzpatrick skin types I to III, participated in this study (Table 1).

Table 1. The Fitzpatrick Classification of Skin Types Chart[1]

Fitzpatrick Skin Type Descriptions*	
Skin Type	**Description**
I	Always burns, never tans
II	Burns easily, tans minimally
III	Burns moderately, tans to light brown
IV	Burns minimally, tans to moderate brown
V	Rarely burns, tans to dark
VI	Never burns, least sensitive to changes
*Adapted from The Surgeon General's Call to Action to Prevent Skin Cancer	

Three randomly assigned test sites were identified on the volar forearm of participants, and baseline moisture measurements were recorded after participants were acclimated in a temperature-controlled room for five minutes to ensure measurements were not skewed and reflective of real-world conditions. Following baseline measurements, participants applied 0.2 g of each test material to their volar forearms twice daily for four weeks. Moisture measurements were recorded once weekly over the four-week study period. The skin test site conditions and treatments are described below (Table 2). All lotion formulations and the Base Lotion were adjusted to a direct pH of 5.0 – 5.5 (Table 2). The Base Lotion utilized in this study was Cetaphil® Moisturizing Cream for All Skin Types.

Table 2. Descriptions of the Conditions and Treatments for each Skin Test Site

Skin Test Site	Condition	Treatment / Test Article Application Description	pH
1	Untreated Control	None	-----
2	Base Lotion	Base Lotion	5.3
3	2.0% **AC LumiVitis**	2.0% **AC LumiVitis** in Base Lotion	5.2

An average of three consecutive moisture measurements per condition at each time point was recorded and expressed as micro-Siemens (µS). Data are displayed as averages from all volunteers and analyzed using t-tests with statistical significance accepted at $p \leq 0.05$. The percent change in moisture was calculated for each test site at every timepoint relative to Baseline values, using the following equation:

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

Results

The data obtained met criteria for a valid study as the Untreated Control and Base Lotion performed as anticipated. Application of 2.0% **AC LumiVitis** twice a day for four weeks demonstrated effective skin hydrating properties by enhancing moisturization throughout the study duration.

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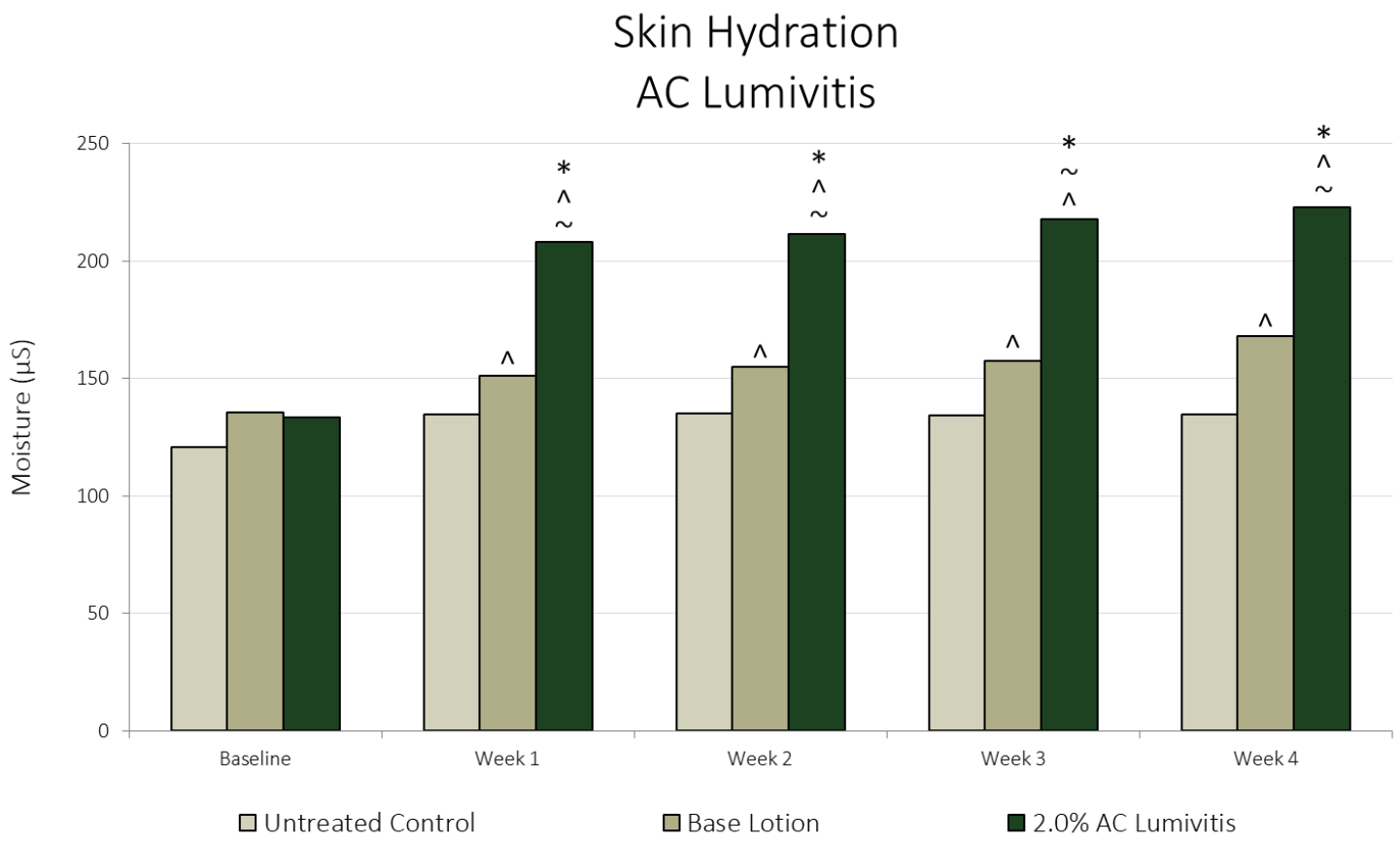

Figure 1. Skin Hydration Overtime* indicates significance ($p \leq 0.05$) compared to Baseline values. ^ indicates significance ($p \leq 0.05$) compared to Untreated Control within the same timepoint. ~ indicates significance ($p \leq 0.05$) compared to Base Lotion within the same timepoint.

Table 3. T-test Analysis of Moisture Levels from Baseline to After Four Weeks of Application. * indicates significance ($p \leq 0.05$) compared to Baseline values.

	Untreated Control	Base Lotion	2.0% AC LumiVitis
4 Weeks After Application	0.512	0.315	< 0.001*

Table 4. T-test Analysis of Moisture Levels After Four Weeks of Application. ^ indicates significance ($p \leq 0.05$) compared to Untreated Control within the same timepoint. ~ indicates significance ($p \leq 0.05$) compared to Base Lotion within the same timepoint.

	Untreated Control vs Base Lotion	Untreated Control vs 2.0% AC LumiVitis	Base Lotion vs 2.0% AC LumiVitis
4 Weeks After Application	0.012^	< 0.001^	< 0.001~

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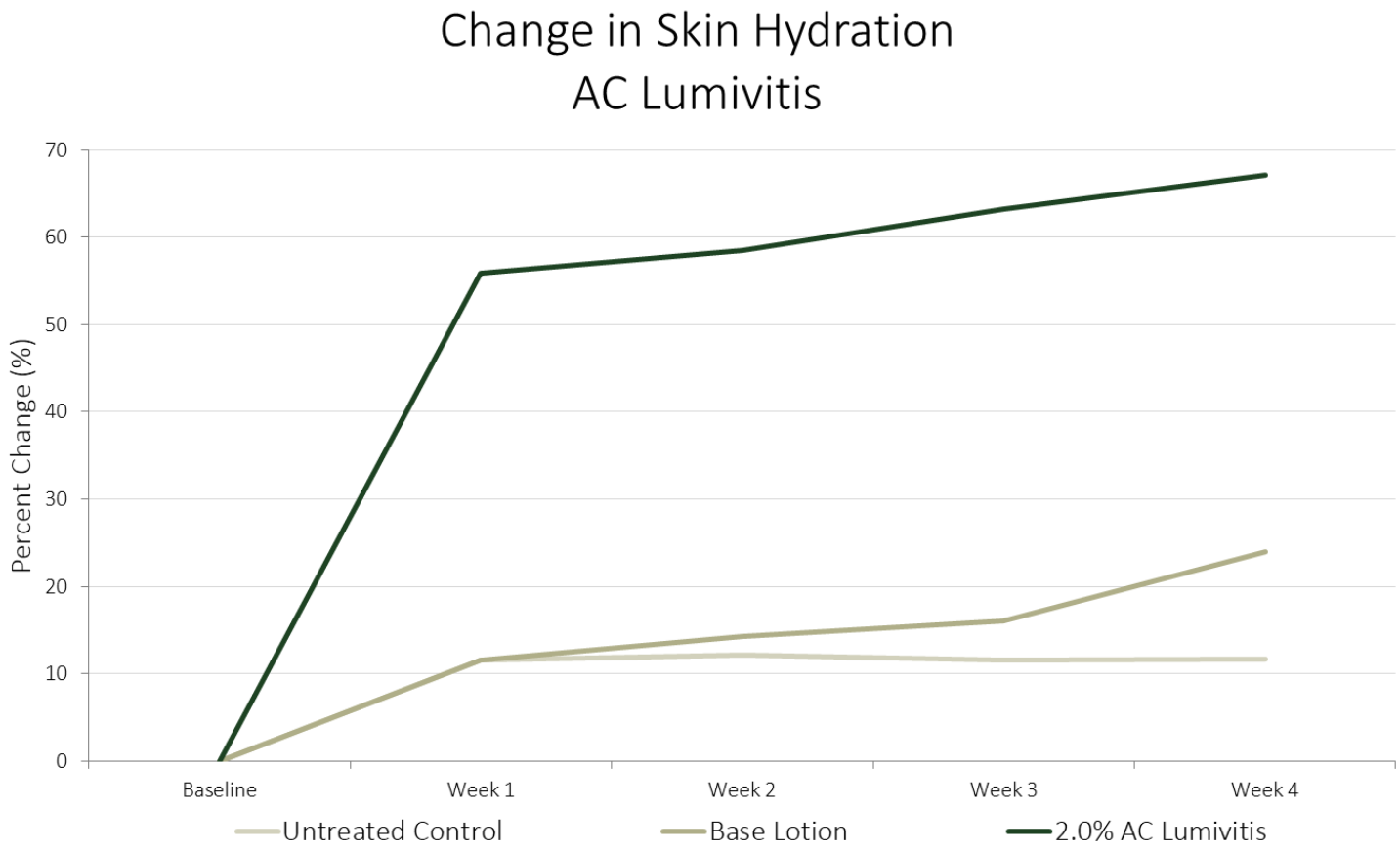

Figure 2. Percent Change in Skin Hydration Relative to Baseline Values.

Discussion

The ability of **AC LumiVitis** to enhance skin moisturization was assessed via hydration throughout four weeks of twice daily application. As shown in Figure 1 and 2, skin moisture did not significantly change throughout the study with the Untreated Control test site, indicating consistent skin hydration over four weeks of application (Table 3). Similarly, skin moisture was not significantly altered throughout the study with Base Lotion application compared to baseline levels, indicating the Base Lotion does not exert significant hydration on the skin (Figures 1, 2; Table 3). Conversely, applying 2.0% **AC LumiVitis** twice a day for four weeks significantly augmented skin moisturization by 67%, compared to baseline, (Figures 1, 2; Table 3). These results demonstrate **AC LumiVitis** has effective skin hydration properties up to four weeks of product application.

Similar results are shown when examining the collective effect of each condition. There is a slight difference in skin hydration between the Untreated Control and Base Lotion throughout the study (Figure 1; Table 4). Moreover, applying 2.0% **AC LumiVitis** significantly increased hydration compared to the Untreated Control and Base Lotion throughout the study (Figure 1; Table 4). These results demonstrate **AC LumiVitis** elicits skin moisturization up to four weeks of product application.

Taken together, these results indicate **AC LumiVitis** increases skin moisturization when added to personal care applications at recommended use levels. Collectively, **AC LumiVitis** demonstrates skin hydration properties which improves the skin's protective barrier function and contributes to the appearance of healthier looking skin.

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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/