Moisturization Assay

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Tradename: ABS Coconut Water PF

Code: 10568PF

CAS #: 8001-31-8

Test Request Form #: 1022

Lot #: 38457

Sponsor: *Active Concepts, LLC; 107 Technology Drive Lincolnton, NC 28092*
Study Director: *Erica Segura*
Principle Investigator: *Maureen Danaher*

Test Performed:
Moisturization/ Hydration Assay

Introduction

An *in-vivo* study was conducted over a period of four weeks to evaluate the moisturization benefits of **ABS Coconut Water PF**. 10 M/F subjects between the ages of 23-45 participated in the study. Results indicate that this material is capable of significantly increasing moisturization compared to the control.

The Moisturization Assay was conducted to assess the moisturizing ability of **ABS Coconut Water PF**.

Materials

A. Equipment: DermaLab Skin Combo (Hydration/ Moisture Pin Probe)

Methods

The moisture module provides information about the skin's hydration by measuring the conducting properties of the upper skin layers when subjected to an alternating voltage. The method is referred to as a conductance measurement and the output is presented in the unit of uSiemens (uS). A moisture pin probe is the tool used to gather hydration values.

10 volunteers M/F between the ages of 23 and 45 and who were known to be free of any skin pathologies participated in this study. A Dermalab Corneometer was used to measure the moisture levels on the subject's volar forearms. The Corneometer is an instrument that measures the amount of water within the skin. The presence of moisture in the skin improves conductance therefore results in higher readings than dry skin.

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Therefore the higher the levels of moisture, the higher the readings from the Corneometer will be. Baseline moisturization readings were taken on day one of the study.

Following initial measurements, all subjects were asked to apply 2 mg of each test material on their volar forearms. Measurements were taken immediately after application of test materials and then weekly for 4 weeks. The test material consisted of **2.0% ABS Coconut Water PF** 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 Coconut Water PF showed very high moisturizing capabilities at a 2.0% concentration. Please note, each value is an average of three consecutive readings per test site.

Moisturization		T = 0	T = 24 Hours	T = 1 Week	T = 2 Weeks	T = 3 Weeks	T = 4 Weeks	T = -24 Hours	T = -1 Week
Panelist 1	Experimental	99	115	197	210	223	231	164	158
	Base Lotion	68	145	188	220	225	230	130	131
	Untreated	80	129	146	150	162	165	110	164
Panelist 2	Experimental	107	180	210	245	256	261	245	95
	Base Lotion	91	155	176	185	189	193	161	133
	Untreated	82	86	121	125	116	120	56	47
Panelist 3	Experimental	76	143	165	192	210	221	188	110
	Base Lotion	43	136	158	161	176	182	59	50
	Untreated	116	119	132	140	122	155	98	105
Panelist 4	Experimental	66	135	182	213	216	235	175	105
	Base Lotion	96	197	210	221	233	234	127	108
	Untreated	102	196	181	139	176	182	113	151
Panelist 5	Experimental	59	150	200	232	255	263	127	77
	Base Lotion	52	155	174	138	145	164	58	55
	Untreated	72	111	115	103	110	112	72	78
Panelist 6	Experimental	109	217	223	234	238	244	182	136
	Base Lotion	100	200	210	230	233	210	116	120
	Untreated	111	147	166	171	163	146	83	157
Panelist 7	Experimental	59	127	171	173	187	195	100	65
	Base Lotion	53	117	176	179	181	202	156	80
	Untreated	80	109	110	135	152	144	115	82
Panelist 8	Experimental	151	155	247	254	263	272	210	145
	Base Lotion	102	198	210	216	160	236	150	97
	Untreated	105	117	122	129	110	139	106	86
Panelist 9	Experimental	151	160	211	216	225	234	125	113
	Base Lotion	156	160	162	176	186	210	88	99
	Untreated	132	121	170	154	165	170	132	111
Panelist 10	Experimental	135	215	235	242	248	256	164	110
	Base Lotion	148	266	277	237	245	235	334	111
	Untreated	176	199	245	171	135	163	247	87
Number of Panelists		10	10	10	10	10	10	10	10

Table 1. Panelist Moisturization Measurements

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Averages	T=0	T = 24 Hours	T = 1 Week	T = 2 Weeks	T = 3 Weeks	T = 4 Weeks	T = -24 Hours	T = -1 Week
2.0% ABS Coconut Water PF in Base Lotion	101.2	159.7	204.1	221.1	232.1	241.2	168.0	111.4
Base Lotion	90.9	172.9	194.1	196.3	197.3	209.6	137.9	98.4
Untreated	105.6	133.4	150.8	141.7	141.1	149.6	113.2	106.8

Table 2. Average Moisture Increase and Regression Scores of Individual Test Sites

Percent (%) Change	T=0 v T=24 Hours	T=0 v T=1 Week	T=0 v T=2 Week	T=0 v T= Week	T=0 v T=4 Week	T=0 v T=-24 Hours	T=0 v T=-1 Weeks
2.0% ABS Coconut Water PF in Base Lotion	57.8	101.7	118.5	129.3	138.3	66.0	10.1
Base Lotion	90.2	113.5	116.0	117.1	130.6	51.7	8.3
Untreated	26.3	42.8	34.2	33.6	41.7	7.2	1.1

Table 3. Comparative Moisture Averages over Time at Each Test Site

Percent (%) Difference	T = 0	T = 24 Hours	T = 1 Week	T = 2 Weeks	T = 3 Weeks	T = 4 Weeks	T = -24 Hours	T = -1 Week
2.0% ABS Coconut Water PF in Base Lotion vs Base Lotion	10.7	7.9	5.0	11.9	16.2	14.0	19.7	12.4
2.0% ABS Coconut Water PF in Base Lotion vs Untreated	4.3	17.9	30.0	43.8	48.8	46.9	39.0	4.2
Untreated vs Base Lotion	15.0	25.8	25.1	32.3	33.2	33.4	19.7	8.2

Table 4. Comparative Moisture Averages between Individual Test Sites

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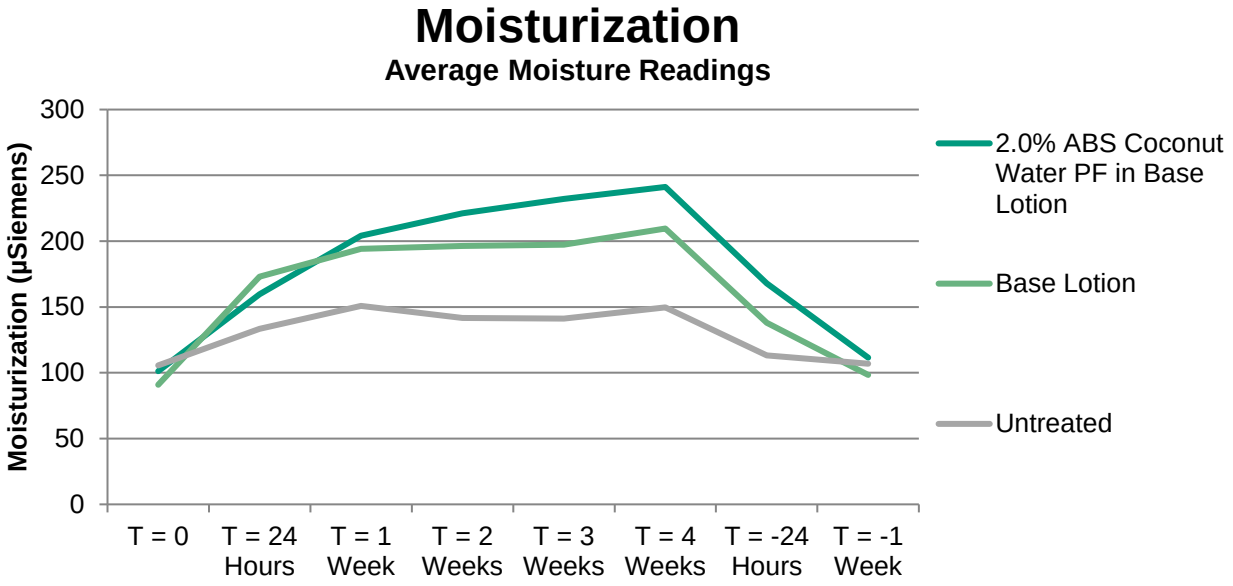

Figure 1. Average Increase in Moisturization at Each Test Site

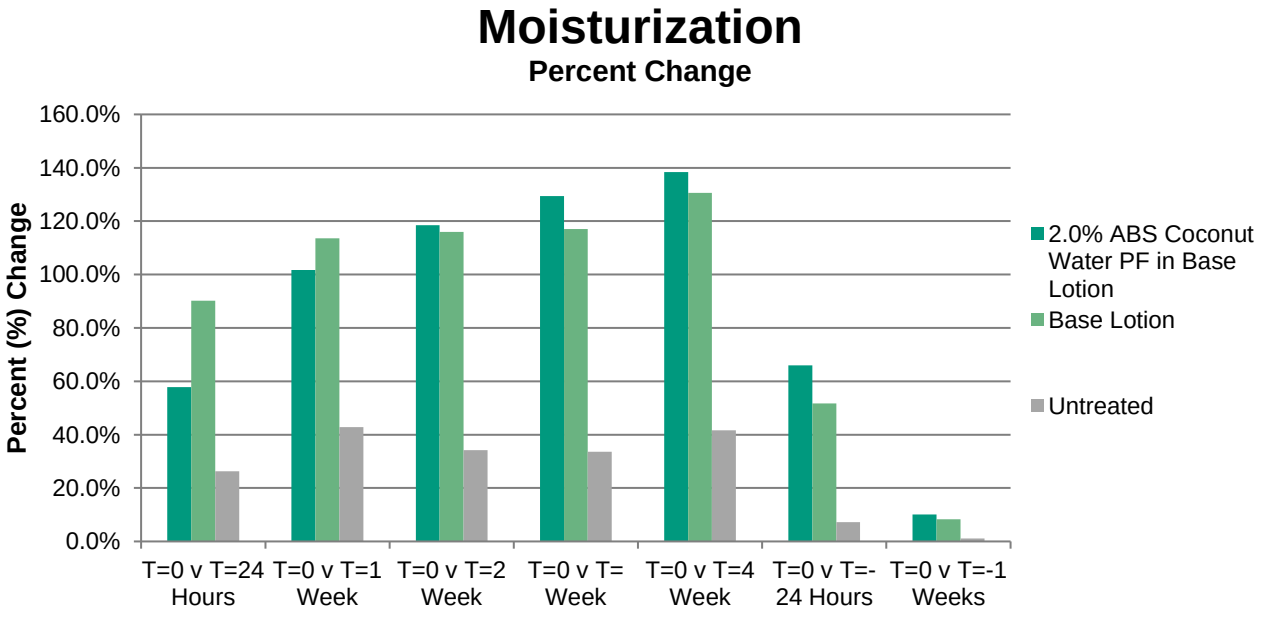

Figure 2. Percent Difference in Moisturization between Two Test Sites over Four Weeks

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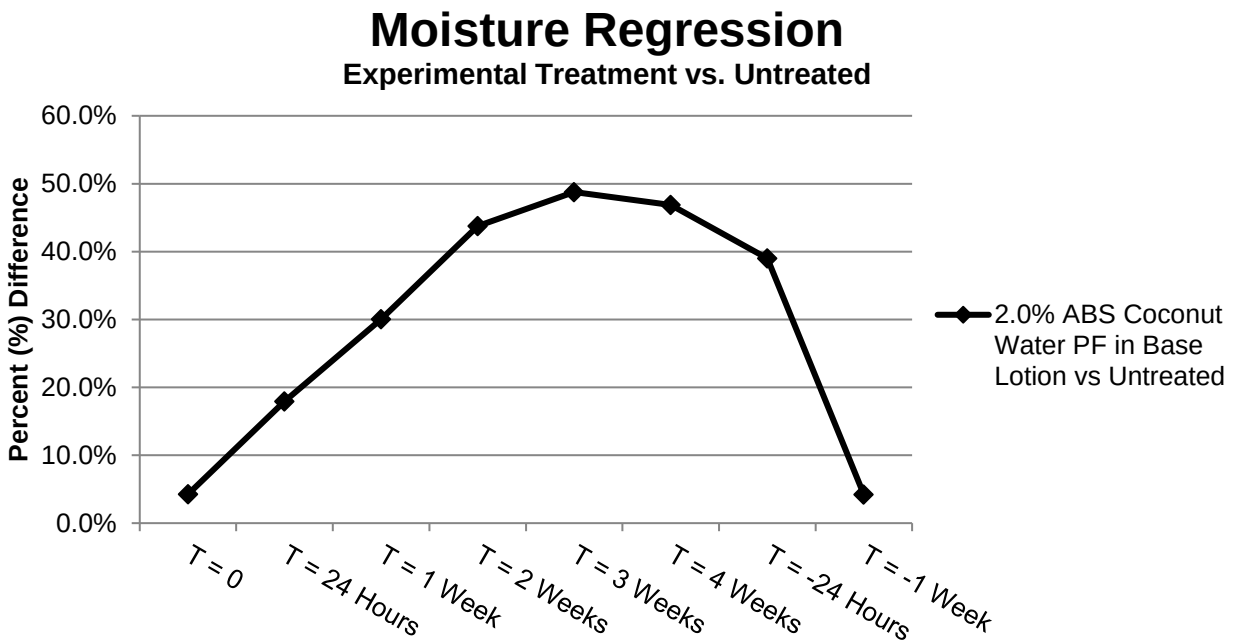

Figure 3. Regression in Skin Moisturization after Application of Experimental Material Ceased

Percent Change of **2.0% ABS Coconut Water PF**	T = 0	T = 24 Hours
Mean	101.2	159.7
Variance	1293.066667	1202.9
T Stat	-3.702853036	
P (T<=t) two-tail	0.00162828	
T Critical two-tail	2.10092204	

Table 5. T-test Analysis of the Moisture Percent Change (%) between Time Points T=0 and T=24 Hours of **2.0% ABS Coconut Water PF** (n=10, α=0.5, df=18)

Percent Change of **2.0% ABS Coconut Water PF**	T = 0	T = 24 Hours
Mean	101.2	241.2
Variance	1293.066667	531.066667
T Stat	-10.3657265	
P (T<=t) two-tail	3.10866E-08	
T Critical two-tail	2.131449546	

Table 6. T-test Analysis of the Moisture Percent Change (%) between Time Points T=0 and T=4 Weeks of **2.0% ABS Coconut Water PF** (n=10, α=0.5, df=15)

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Percent Difference at 4 Weeks	**2.0% ABS Coconut Water PF**	Base Lotion
Mean	241.2	209.6
Variance	531.0666667	614.2667
T Stat	2.952712295	
P (T<=t) two-tail	0.008516432	
T Critical two-tail	2.10092204	

Table 7. T-test Analysis of the Moisture Percent Difference (%) between **2.0% ABS Coconut Water PF** and the Base Lotion at T= 4 Weeks (n=10, α=0.5, df=18)

Percent Difference at 4 Weeks	**2.0% ABS Coconut Water PF**	Untreated Control
Mean	241.2	149.6
Variance	531.0666667	484.2666667
T Stat	9.090570757	
P (T<=t) two-tail	3.79334E-08	
T Critical two-tail	2.10092204	

Table 8. T-test Analysis of the Moisture Percent Difference (%) between **2.0% ABS Coconut Water PF** and the Untreated Control at T= 4 Weeks (n=10, α=0.5, df=18)

Percent Difference at -24 Hours	**2.0% ABS Coconut Water PF**	Untreated Control
Mean	168	113.2
Variance	1836	2714.844444
T Stat	2.56882526	
P (T<=t) two-tail	0.019922172	
T Critical two-tail	2.109815578	

Table 9. T-test Analysis of the Moisture Percent Difference (%) between **2.0% ABS Coconut Water PF** and the Untreated Control at T= -24 Hours (n=10, α=0.5, df=17)

Percent Change of **2.0% ABS Coconut Water PF**	T = 0	T = -24 Hours
Mean	101.2	168
Variance	1293.066667	1836
T Stat	-3.77632231	
P (T<=t) two-tail	0.001506325	
T Critical two-tail	2.109815578	

Table 10. T-test Analysis of the Moisture Percent Change (%) between Time Points T=0 and T=-24 Hours of **2.0% ABS Coconut Water PF** (n=10, α=0.5, df=17)

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Discussion

As evidenced in a 4 week efficacy study of **ABS Coconut Water PF** on skin, moisture levels were significantly improved by 57.8% (p=0.0016) after 24 hours and by 138.3% (p=3.1E-8) after 4 weeks when compared to the baseline (Tables 5 & 6). Comparisons of the base lotion and untreated site to the experimental lotion containing **2.0% ABS Coconut Water PF** demonstrate significantly higher moisturization at 4 weeks by 14.0% (p=0.0085) and 46.9% (p=3.8E-8), respectively (Figures 7 & 8). Results indicate that **ABS Coconut Water PF** is capable of increasing moisturization when compared to both the untreated control as well as the base lotion.

Furthermore, when examining the moisture levels on the skin after application of test materials stopped, it was determined that **ABS Coconut Water PF** 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% ABS Coconut Water PF** + Base Lotion was 39.0% (p=0.020) more moisturized than the site which did not receive treatment (Figure 9). Additionally, the site treated with **2.0% ABS Coconut Water PF** + Base Lotion continued to significantly increase moisture by 66.0% (p=0.0015) 24 hours after treatment ceased when compared to baseline readings (Table 10).

ABS Coconut Water PF was designed to provide moisturization benefits, and with the present study we can confirm that this succulent botanical ingredient is not only capable of providing protective benefits but also ideal for moisturizing and skin hydrating personal care applications.

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