

BotanicalsPlus

BP—BotaniDew™ NMF

Replenishes Skin's NMF



INCI Name: Water (and) Citrullus Lanatus (Watermelon) Fruit Extract (and) Chenopodium Quinoa Seed Extract (and) Urea (and) Sucrose (and) Glycerin (and) Sodium Lactate (and) Sodium PCA

Key Benefits:

- Replenishes skin's NMF (Natural Moisturizing Factor)
- Delivers instant and prolonged hydration for up to 12 hours
- Maintains softness and suppleness of skin

Background

The Natural Moisturizing Factor (NMF) of the skin is a composition found naturally in the skin that keeps it from dehydrating. Filaggrin (filament aggregating protein) is part of the structural components of the skin that gives it mechanical stability. Filaggrin is naturally broken down by the skin's protease enzymes to create NMF, which consists mainly of urea, lactate, pyrrolidone carboxylic acid (PCA), sugars, amino acids, and inorganic ions. The NMF is found within the corneocytes.

The skin's NMF is vital to maintaining adequate skin hydration, which supports three important functions of the skin: 1) it plasticizes the skin, keeping it soft and supple, 2) it promotes the activity of hydrolytic enzymes, which allow desquamation and skin renewal, and 3) it contributes to the barrier function of the stratum corneum. The NMF is a powerful humectant which draws atmospheric water into the skin and binds it.

Product Information

BP—BotaniDew™ NMF is a combination of natural quinoa extract and natural watermelon extract complexed with glycerin, urea, lactate, and PCA (Pyrrolidone Carboxylic Acid) to produce a product whose composition of these beneficial ingredients also includes ions, calcium, iron, magnesium, potassium, and phosphate mirroring the natural composition of the skin's NMF (Natural Moisturizing Factor).

Typical Properties

Appearance @ 25°C	Clear to Slightly Hazy, Colorless to Pale, Light Yellow Liquid
Odor	Characteristic
pH (@ 25°C)	4.0 – 7.0
Specific Gravity @ 25°C	1.02 – 1.20
Refractive Index @ 25°C	1.3750 – 1.5000
Solubility in Water	Soluble
Microbial Content	<100 opg, no pathogens
Recommended Use Level	3 – 20%

Product Applications:

- Skin care products for dry and sensitive skin
- Skin treatment products that enhance hydration, NMF replenishment, skin elasticity, and radiance
- Hand sanitizers

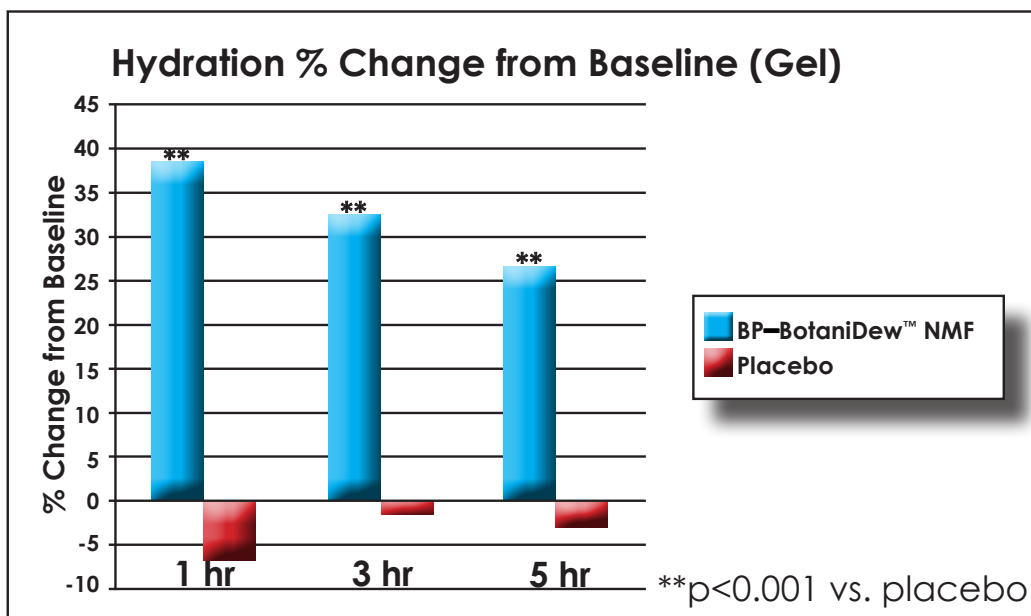
BP—BotaniDew™ NMF reinforces the primary functions of the NMF by replenishing skin's natural NMF, which may be diminished due to environmental insults from soap, sanitizers, environmental pollution, sun exposure, aggressive exfoliation, or normal aging of the skin producing dry, scaling, cracking, flaking skin.

Depletion and loss of NMF is a common condition resulting in fatigued, dry, compromised skin. **BP—BotaniDew™ NMF** replenishes skin's NMF and acts as an excellent moisturizing agent that will deliver **instant hydration and prolong the impact of hydration for up to 12 hours (in most environmentally neutral conditions)**.

BP—BotaniDew™ NMF's composition of synthetic and natural ingredients replenish lost NMF and mimics the behavior and function to moisturize the skin and overcome any deficiencies in NMF to renew the skin, giving it a hydrated, smooth, youthful appearance.

Clinical Study — Gel Formulation

A clinical study was performed comparing the effects of a simple, aqueous 1% xanthan gum gel containing 15% **BP—BotaniDew™ NMF** vs. a placebo gel without **BP—BotaniDew™ NMF**. The study was performed on 14 subjects (4 male and 10 female) ranging in age from 23 to 50. A 4 cm x 7 cm area was marked on both inside forearms of each subject and baseline skin hydration readings taken using a DermLab® Series SkinLab Combo instrument (Cortex Technology, Denmark) which employs a skin conductance methodology with output in units of micro-Siemens (μS). Measurements were taken at four positions within the marked skin areas and the average of the readings was recorded. Two drops of the placebo gel were applied to one forearm and two drops of the test gel to the other forearm of each subject, who were then instructed to rub the gel into the skin within the marked areas. Hydration measurements were then taken at time periods of 1, 3, and 5 hours after application.

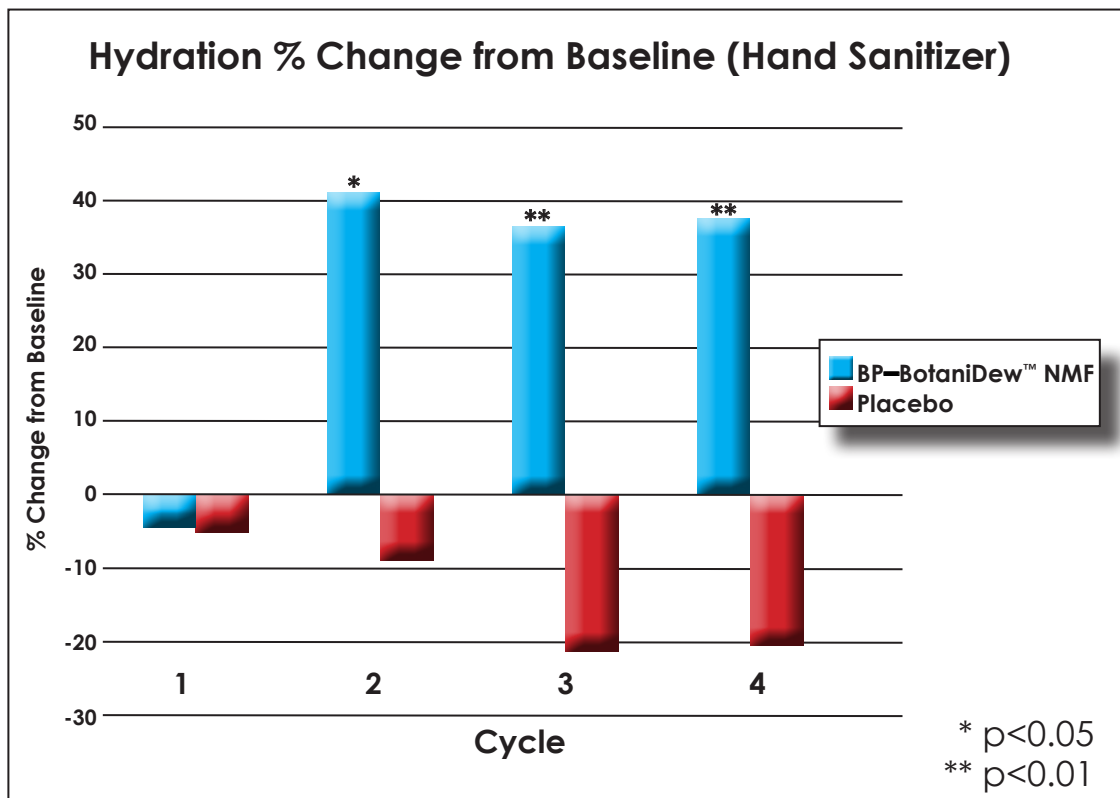


Results

There was a highly statistically significant ($p<0.001$) increase in skin hydration for the **BP—BotaniDew™ NMF** gel vs. the placebo gel at all time points, with all 14 subjects showing increases at all time points. The average increase 1 hour after application was 38.5% above baseline, and 5 hours after application the average value was 26.6% above baseline. **A linear extrapolation of the test results predicts that it will take 14 hours for the hydration readings to return to baseline.**

Clinical Study — Hand Sanitizer Formulation

A second clinical study was performed comparing the effects of a simple hand sanitizer formulation containing 70% ethanol in water thickened with 1.5% Hydroxypropyl Methylcellulose with and without 5% BP—BotaniDew™ NMF. In this study the samples were applied every 15 minutes to simulate the frequent hand sanitizer use of a health care worker. The study was performed on 8 subjects (4 male and 4 female) ranging in age from 20 to 65. Baseline skin hydration measurements were taken at four locations on the back of both hands and the average reading recorded for each hand. The test hand sanitizer gel was then applied to the back of one hand and the placebo gel to the other hand and the gels were rubbed in until dry. Hydration readings were taken after 15 minutes, and the gels reapplied to each hand. This reading/reapplication cycle was repeated four times.



Results

There were statistically significant differences in skin hydration between the BP—BotaniDew™ NMF hand sanitizer and the placebo gel for cycles 2-4 of the study. At the fourth cycle the placebo gel resulted in an approximately 20% decrease from baseline in average skin hydration, as would be expected from a 70% alcohol formulation, while the formulation containing BP—BotaniDew™ NMF resulted in an approximately 40% increase in skin hydration.

Results Summary

A single application of a gel formulated with BP—BotaniDew™ NMF was highly effective in increasing skin hydration for the 5 hour duration of the test, verifying that it will be a significant, beneficial ingredient in skin care products. BP—BotaniDew™ NMF was highly effective at a 5% level in an alcohol-based hand sanitizer formulation. It not only prevented the loss of skin hydration caused by repeated use of the formulation, but produced a 40% increase in skin hydration readings.

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