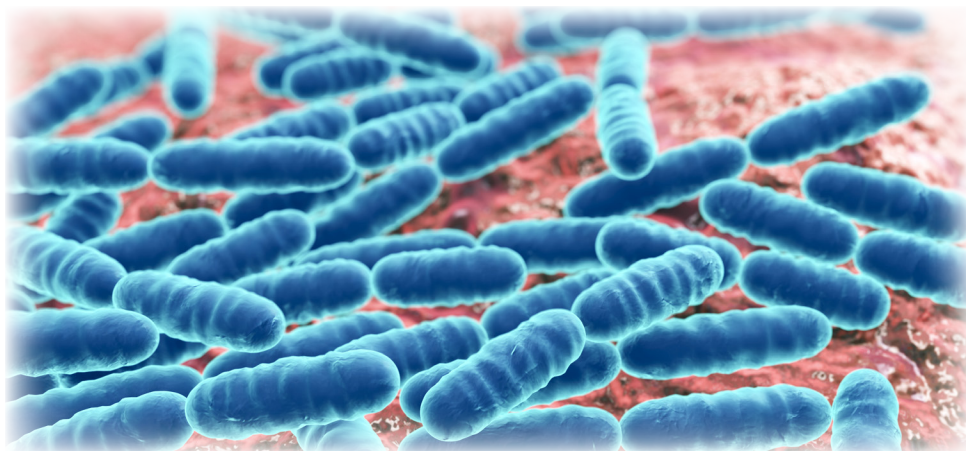


ACB Yogurt Dermal Respiratory Factor PF



ATP Synthesis
Collagen Production

heat shock elements
live yeast cell derivative (LYCD)

Lactobacillus

capitalize on probiotic marketability
trending in both skin and hair care product lines!

BACKGROUND

The health benefits associated with dairy were recognized by many ancient cultures and it has been said that Cleopatra bathed in milk so that her skin would be silky smooth. The practice of fermenting milk into yogurt for preservation is thought to predate recorded history. Anthropologists have found evidence suggesting that Middle Eastern civilizations, as early as 2,000 B.C.E., consumed yogurt and in 76 B.C.E. the Roman historian, Plinius, suggested the use of “fermented milk products for treating gastroenteritis”. The result of the growing probiotic trend is the increased use of probiotics in a wide array of personal care and cosmetic applications

SCIENCE

The mechanism by which live yeast cell derivatives (LYCD) reduce irritation has only recently become clear with the increased focus on the field of Heat Shock Proteins (HSP) or stress response elements. When cells are subject to stress, they produce a class of proteins, termed stress response elements. These stress response elements either duplicate functions disabled by the stress, or protect the cell against additional stress. It is speculated that one or more components of LYCD is actually stress response elements. Given the similarity between yeast and human cells, it is probable that these stress response elements help reduce or reverse the actual stress encountered by the human cell when topically applied. In fact studies have shown that probiotics may even reduce symptoms of atopic dermatitis and eczema in infants and children.

BENEFITS

Since live bacteria cannot be used in cosmetics, beauty manufacturers looking to capitalize on the benefits associated with probiotics have investigated the option of incorporating bacterial lysates into their formulations. The understanding being that these deliver similar probiotic benefits.

Code Number: 20224PF

INCI Name: Lactobacillus Ferment
Lysate Filtrate

INCI Status: Conforms

REACH Status: Complies

CAS Number: 68333-15-3

EINECS Number: N/A

Origin: Bacteria & Botanical

Processing:

GMO Free

No Ethoxylation

No Irradiation

No Sulphonation

Additives:

Natural Anti-Microbial: Leuconostoc/
Radish Root Ferment Filtrate

Preservatives: None

Antioxidants: None

Other additives: None

Solvents Used: Water

Appearance: Clear to Slightly Hazy
Semi-Viscous Liquid

Soluble/ Miscible: Water

Microbial Count: <100 CFU/g,
No Pathogens

Suggested Use Levels: 2.0% - 5.0%

Suggested Applications: Cellular
Respiration, Collagen Production,
Probiotic, Soothing, ATP Synthesis

Benefits of ACB Yogurt DRF PF:

- Promotes Homeostasis
- Increases Collagen Synthesis
- Soothing
- Prebiotic Marketability
- Increases Cellular Respiration

ACB Yogurt Dermal Respiratory Factor PF

Yogurt contains powerful probiotics that can improve the texture and health of the skin! Active Concepts developed **ACB Yogurt Dermal Respiratory Factor PF**, which is intended to increase cellular respiration, cellular metabolism and collagen production. **ACB Yogurt Dermal Respiratory Factor PF** is produced by prompting live *Lactobacillus bulgaricus* cells to secrete stress response elements by striking the *Lactobacillus* cells with specific wavelengths of UV radiation. Using biofermentation and various filtration techniques, the secretion is then isolated and extracted from the live bacteria cell to deliver various anti-aging benefits and provides anti-irritant properties.

EFFICACY

In-vitro analysis was used to determine **ACB Yogurt Dermal Respiratory Factor PF**'s effect on increasing cellular oxygen uptake. Cultured human dermal fibroblasts maintained in culture flasks were prepared by replacing the culture media with PBS supplemented with magnesium, calcium, and succinate.

The cells were incubated for 4 hours and then harvested and resuspended in PBS with magnesium and calcium. The 2.0×10^6 titers of cells were transferred to an oxygen electrode chamber where the basal oxygen consumption was measured by means of an oxygen electrode. (Hansatech DW3) Untreated cells were used to obtain a baseline oxygen consumption measurement. The cells were then cleared and recharged with a fresh titer of cells to which was added 0.25 % (w/w) of **ACB Yogurt Dermal Respiratory Factor PF**. Results are expressed relative to the number of viable cells recovered from the electrode chamber. Clearly, **ACB Yogurt Dermal Respiratory Factor PF** produced an increase in oxygen uptake comparable to yeast derived LYCD.

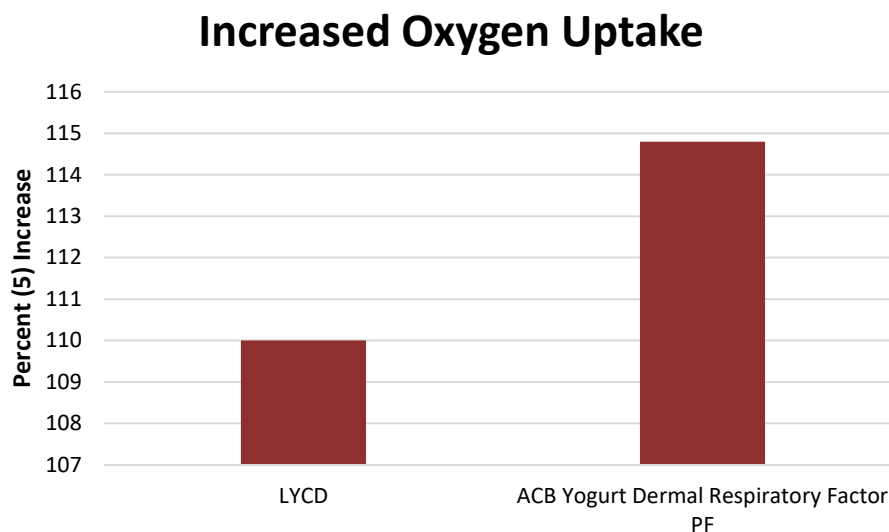


Figure 1. Oxygen uptake of **ACB Yogurt Dermal Respiratory Factor PF** compared to LYCD.

An *in-vitro* Sirius Red/Fast Green Collagen Assay was conducted to assess the changes in collagen synthesis by **ACB Yogurt Dermal Respiratory Factor PF** treated *in vitro* cultured human dermal fibroblasts. As shown in Figure 2, **ACB Yogurt Dermal Respiratory Factor PF** exhibited potent collagen synthesis activity. As expected, the rate of increase for collagen synthesis using **ACB Yogurt Dermal Respiratory Factor PF** appears to be dose dependent. The increase in collagen production may lead to improvement in the dermal-epidermal junction integrity as well as an improved scaffolding matrix. For these reasons, we can assume **ACB Yogurt Dermal Respiratory Factor PF** is suitable for cosmetic applications designed to boost collagen synthesis to aid in providing a younger and healthier complexion.

ACB Yogurt Dermal Respiratory Factor PF

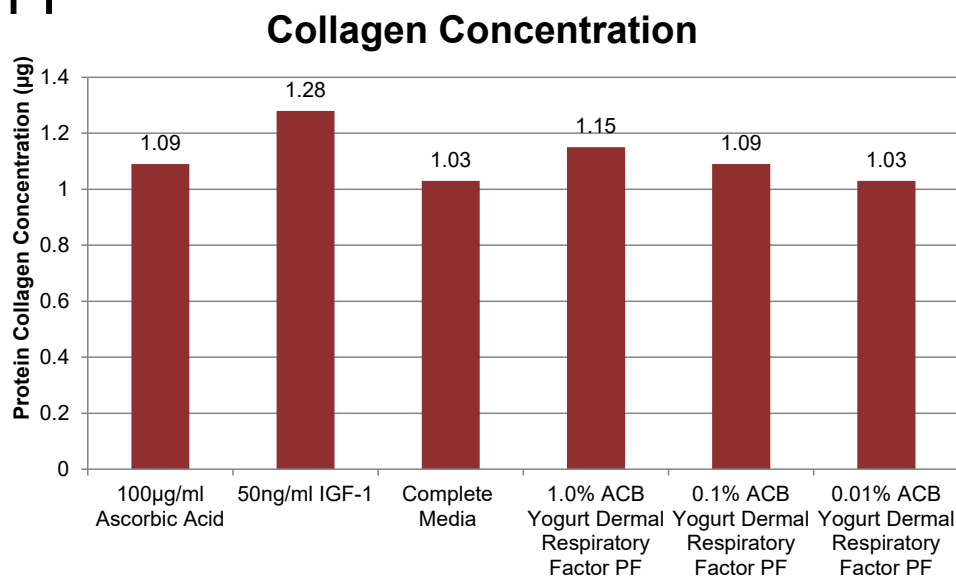


Figure 2. Increases in collagen production following application of **ACB Yogurt Dermal Respiratory Factor PF**.

An *in-vitro* ATP Assay was conducted to determine if 2.0% **ACB Yogurt Dermal Respiratory Factor PF** can increase ATP synthesis, which indicates an increase in cellular metabolism. ATP, or adenosine triphosphate, is indicative of cellular metabolism, as it is the molecule from which cells derive energy. If ATP levels increase, we can assume that cellular metabolism is increasing as well. **ACB Yogurt Dermal Respiratory Factor PF** showed a significant increase in ATP levels compared to the control. After 24 hours there was a 42% increase in ATP levels from **ACB Yogurt Dermal Respiratory Factor PF**. We can assume that **ACB Yogurt Dermal Respiratory Factor PF** is capable of increasing ATP synthesis and metabolic function of cells.

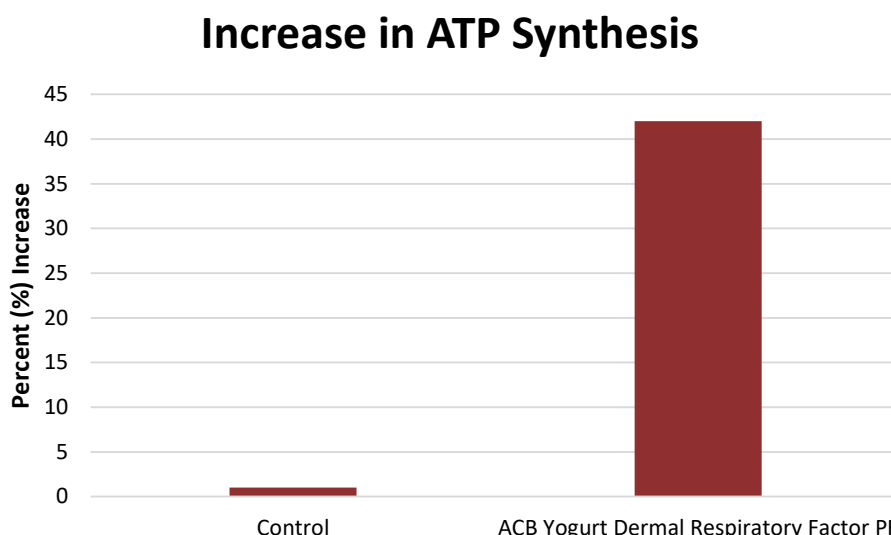


Figure 3. Increases in ATP synthesis following application of **ACB Yogurt Dermal Respiratory Factor PF**.

An ORAC Assay was conducted to assess the antioxidant capacity of **ACB Yogurt Dermal Respiratory Factor PF**. The oxygen radical absorbance capacity (ORAC) assay is a standard method used to assess antioxidant capacity of physiological fluids, foods, beverages, and natural products. This assay quantitatively measures a sample's ability to quench free radicals that have the potential to react with and damage cellular components. The antioxidant capacity of **ACB Yogurt Dermal Respiratory Factor PF** increased as the concentration increased, as a result we can assure that its ability to minimize oxidative stress is dose dependent.

ACB Yogurt Dermal Respiratory Factor PF

ORAC Assay

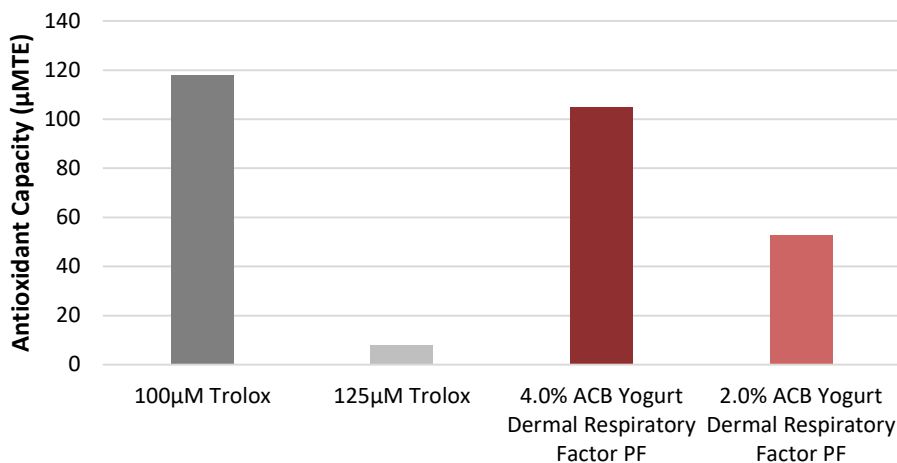


Figure 4. Results of the antioxidant capacity of test materials.

Stress treated fermentation products such as LYCD have been used in a variety of applications within the cosmetics industry, one of which is to reduce irritation. An *in-vivo* study was done to determine the efficacy of **ACB Yogurt Dermal Respiratory Factor PF** as an anti-irritant. A panel of subjects were assembled to evaluate the anti-irritation effects between the product and a placebo.

Improvement in Irritation

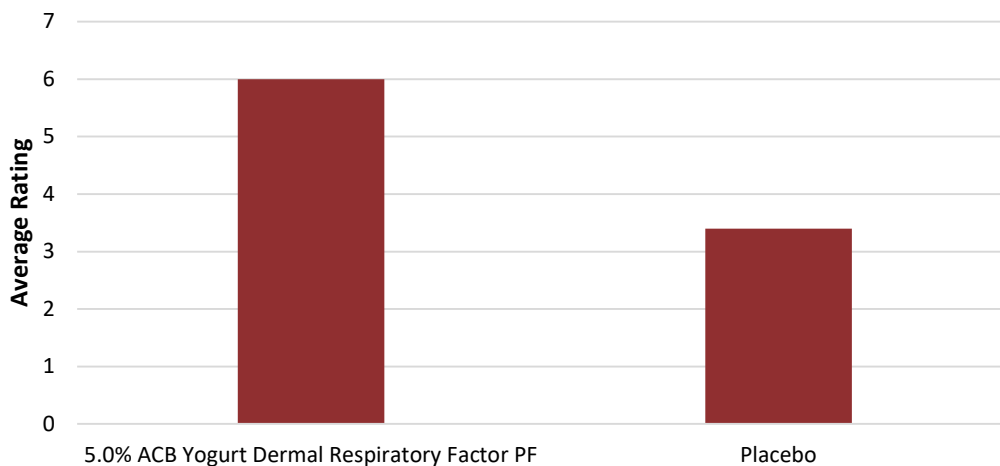


Figure 5. Average anti-irritancy ratings for **ACB Yogurt DRF PF** compared to placebo.

Based on the subject evaluations we can determine that **ACB Yogurt Dermal Respiratory Factor PF** reduces irritation 71% better than the placebo.

An *in-vivo* study was conducted to evaluate the benefits of **ACB Yogurt Dermal Respiratory Factor PF** as an anti-irritant using visible redness as a marker. The tape stripping study was conducted with 5 M/F subjects between the ages of 24 and 45 years old. The subjects were asked to evaluate the reduction in irritation using **ACB Yogurt Dermal Respiratory Factor PF** compared to the unloaded control lotion. Volunteers applied Lubriderm Lotion, which has been mixed with 5.0% **ACB Yogurt Dermal Respiratory Factor PF** to an irritated patch of skin on their right or left volar forearm. As a control, the subjects will also apply an unloaded lotion to an equally irritated patch of skin on another section of the same volar forearm.

ACB Yogurt Dermal Respiratory Factor PF

SUBJECT ONE - ACB YOGURT DRF PF - IN-VIVO TREATMENT

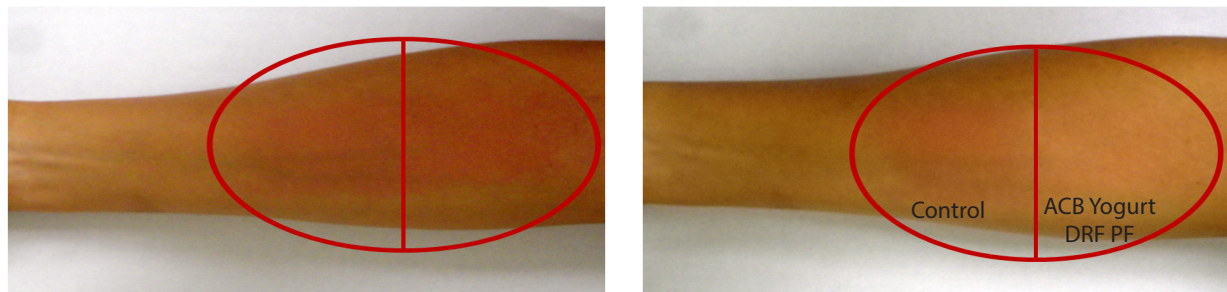


Figure 6. Subject 1 - Test for the **ACB Yogurt DRF PF** before and after *in-vivo* redness reduction study.

SUBJECT TWO - ACB YOGURT DRF PF - IN-VIVO TREATMENT



Figure 7. Subject 2 - Test for the **ACB Yogurt DRF PF** before and after *in-vivo* redness reduction study.

The results indicate that **ACB Yogurt Dermal Respiratory Factor PF** is an effective ingredient for alleviating redness caused by physical irritation of the epidermis.

ACB Yogurt Dermal Respiratory Factor PF is capable of increasing oxygen uptake while stimulating collagen synthesis and enhancing cellular functions. These elements isolated from the bacteria, also have anti-irritant properties and are capable of modulating wound healing to preserve epidermal integrity, while capitalizing on the probiotic trend.

References:

- 1) Fuller R (May 1989). "Probiotics in man and animals". The Journal of Applied Bacteriology 66 (5): 365–78.
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- 3) Boyle RJ, Bath-Hextall FJ, Leonardi-Bee J, Murrell DF, Tang ML (2008). Boyle, Robert John. ed. "Probiotics for treating eczema". Cochrane Database Syst Rev (4): CD006135
- 4) Bentley, P. *et al.* (1990) "Peptides from Live Yeast Cell Derivative Stimulate Wound Healing" Reprint from the Archive of Surgery May1990, Vol. 125.



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