

# AC Dermal Respiratory Factor Advanced PF



AGlobal, Metabolic  
**Stimulant**  
 • enhances cell health  
 at every level  
 promotes collagen + elastin synthesis  
 increases cellular oxygenation + metabolism  
 soothing formula.  
**perfect for wound healing**

## BACKGROUND

A global, metabolic stimulant, AC Dermal Respiratory Factor Advanced PF increases cellular oxygenation and wound healing while promoting collagen and elastin synthesis, truly increasing cellular metabolism at every level while also having the ability to reduce inflammation.

Commercially **Live Yeast Cell Derivative** (LYCD) has been used for several distinct purposes, pointing to the overall utility of this material in relationship to the treatment of living organisms. The first widespread use of LYCD began far from the Cosmetic arena. American Home Products utilized LYCD as the active in the well-known anti-hemorrhoidal product Preparation H®. Legend has it that some adventurous fashion models brought about the crossover into cosmetics. Having begun to manifest one of the most visible symptoms of sleep deprivation, the models began to dab LYCD containing creams on the bags under their eyes. As would be expected the swelling subsided, the practice spread by word of mouth, and a core Cosmetic raw material was born.

**Code Number: 20219PF**

**INCI Name:** Water & Saccharomyces Lysate Extract  
**INCI Status:** Conforms  
**REACH Status:** Approved  
**CAS Number:** 7732-18-5 & 8013-01-02  
**EINCS Number:** 231-791-2 & 232-387-9

**Origin:** Yeast  
**Processing:**  
 GMO Free  
 No Ethoxylation  
 No Irradiation  
 No Sulphonation

**Additives:**  
 Preservatives: None  
 Antioxidants: None  
 Other additives: None

**Solvents Used:** Water  
**Appearance:** Clear Yellowish Liquid  
**Soluble/ Miscible:** Water  
**Ecological Information:**  
 100% Biodegradability  
**Microbial Count:** < 100opg,  
 No Pathogens

**Suggested Use Levels:** 0.5 - 1.0%  
**Suggested Applications:** Increase in Cellular Respiration, Enhanced Cellular Metabolism, Collagen & Elastin Synthesis, Soothing

## Benefits of AC Dermal Respiratory Factor Advanced PF:

- Global Metabolic Stimulant
- Efficacious Soothing Benefits
- Promotes Wound Healing
- Stimulates Collagen Production
- Stimulates Elastin Production
- Increases Cellular Respiration

# AC Dermal Respiratory Factor Advanced PF

In North America, South America, and Europe LYCD is primarily used to **stimulate oxygen consumption**, combat irritation, or as, what could probably be best termed, a **cosmetic potentiator**.

In Asia, LYCD is primarily used to **increase the translucency of skin**. Translucency is especially important for whitening applications. The idea being that if skin is more translucent it is much easier to appreciate the evenness of skin-tone achieved with whitening products. Many major **Cosmetic Companies** such as Pacific, Shiseido, Max Factor, Avon, Coreana, and Kanebo all utilize yeast extracts as a core raw material in their skin care products.

Over 600 species of yeast exist with the most well known yeast being *Saccharomyces cerevisiae*. *Saccharomyces cerevisiae* better known as bakers or brewer's yeast, although cherished for its fermentation abilities, was once considered to be an inutile organism by the scientific world. Within the past 30-40 years the wonders of yeast have finally been recognized. Because yeast cells are very similar to human cells in composition and structure, they make for a perfect palate to research scientists.

Like a human cell, a yeast cell is a true eukaryote. It has a nucleus that contains the nucleoli and chromosomes, which are separated from the cytoplasm by a nuclear membrane. Yeast cells have 17 chromosomes, while human cells have 23 chromosomes, but their structures are very similar. Yeast also has two genders and reproduces with cells that are similar to humans' means of fertilization. In 1996, the yeast cell became the **first living organism to have a completely mapped genome**.

In 1896, German chemist Eduard Büchner discovered that the **fermentation enzymes** found in yeast cells would remain active even after extraction from the cells as long as they were not boiled. This discovery soon paved way for the delineation of the biochemical process of fermentation as well as the rising of bread.

## SCIENCE

The rationale behind increasing oxygen consumption is that the more efficiently a cell consumes oxygen, the less oxygen is available to become excited to form destructive reactive oxygen species (ROS).

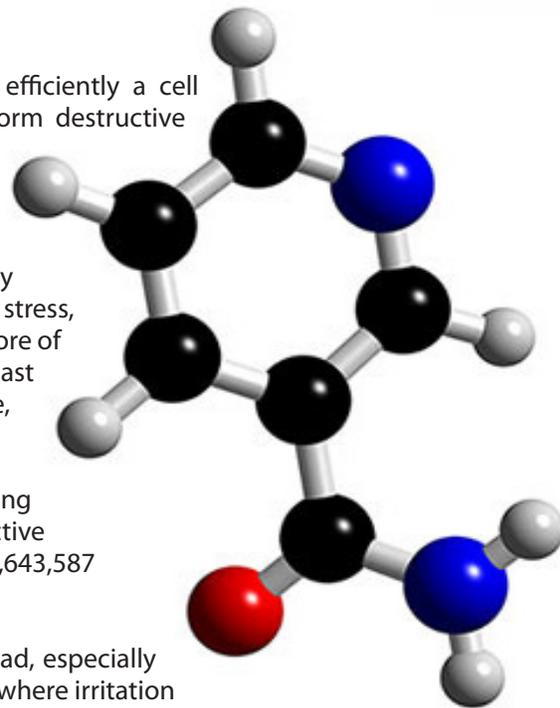
The mechanism by which LYCD reduces irritation has only recently become clear with the increased focus on the field of **Heat Shock Proteins (HSP)**. When cells are subject to stress, be it physical or emotional, they produce a class of proteins that either duplicate functions disabled by the stress, or **protect the cell against additional stress**. It is speculated that one or more of the components of LYCD is actually a Hsp. Given the similarity between yeast and human cells it is probable that when applied the HSP(s) help to reduce, or reverse the actual stress presented to the human cell.

Given that LYCD is a global metabolic stimulant, as opposed to working on a single pathway, it is capable of potentiating the activity of other active ingredients. The utility is evidenced in Avon's patents US 5,676,956 and US 5,643,587 where LYCD is used to increase the activity of Vitamin C derivatives.

While the specific application is covered the possible applications are broad, especially in conjunction with actives such as Retinol, and its associated compounds, where irritation is an unwanted side-effect. Hans A. Schaeffer, widely recognized for his role in popularizing the use of LYCD in the cosmetic field, in conjunction with Henry Calam, were issued a patent (US 5,057,497) for the use of LYCD in maintaining healthy gingival tissue.

## BENEFITS

A global, metabolic stimulant, AC Dermal Respiratory Factor Advanced PF increases cellular oxygenation and wound healing while promoting collagen and elastin synthesis, truly increasing cellular metabolism at every level while also having the ability to reduce inflammation.



# AC Dermal Respiratory Factor Advanced PF

Utilizing the work of Dr. George Sperti and the more recent working knowledge of the yeast cell, we have developed a yeast derived extract for topical application, AC Dermal Respiratory Factor Advanced PF. Produced by prompting live yeast cells to secrete synergistically active compounds, by striking the yeast cells with specific wavelengths of UV radiation, we then isolate and extract the active. This process utilizes biofermentation and various filtration techniques, such as tangential flow filtration, resulting in an extraction that is responsible for the increase in such phenomena as enhanced cellular respiration, cellular proliferation and improved cellular metabolism.

Due to their efficacious soothing properties, and metabolic enhancing benefits, live yeast cell derivatives (LYCD) are widely used in the cosmetic and personal care industries. LYCD is produced when live yeast cells are exposed to stress, such as UV radiation. This yields a material which has shown to stimulate cellular metabolism by promoting the increase of cellular energy, while also helping minimize irritation.

When added to cosmetic applications, AC Dermal Respiratory Factor Advanced PF is capable of soothing the skin and enhancing cellular function. As an added benefit, this product can also help optimize keratinization to further stimulate the health of the skin and/or scalp. Help your skin breathe easy and reap the benefits of a glowing, youthful looking aesthetic!

## EFFICACY

Reactive oxygen species (ROS) are generated by normal cellular processes, environmental stresses, and UV irradiation. ROS are detrimental to cellular structures and functional molecules (i.e DNA, proteins, lipids) as they act as strong oxidizing agents or free radicals. The oxygen radical absorbance capacity (ORAC) assay is a standard method used to assess antioxidant capacity of physiological fluids, foods, beverages, and natural products. The assay quantitatively measures a sample's ability to quench free radicals that have the potential to react with and damage cellular components. Oxygen Radical Absorbance Capacity (ORAC) assay was conducted to assess the antioxidant capacity of AC Dermal Respiratory Factor Advanced PF. As shown in figure 1, AC Dermal Respiratory Factor Advanced PF exhibited antioxidant activity comparable to 100µM Trolox®. The antioxidant capacity of AC Dermal Respiratory Factor Advanced PF increased as the concentration increased, as a result we can assure that its ability to minimize oxidative stress is dose dependent. AC Dermal Respiratory Factor Advanced PF was designed to aid in cellular respiration and metabolism, and function to increase collagen synthesis. With the present study we can confirm that this unique ingredient is not only capable of providing functional benefits but it is also capable of providing potent antioxidant benefits when added to cosmetic applications.

### ORAC Assay

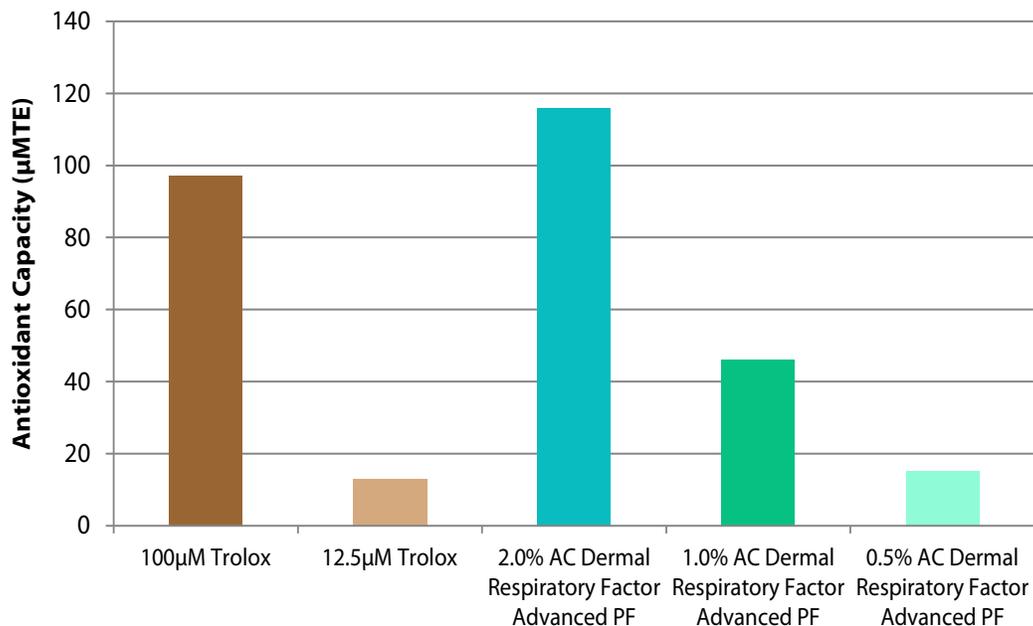


Figure 1. Antioxidant capacity of AC DRF PF in comparison to Trolox

# AC Dermal Respiratory Factor Advanced PF

Through decades of thorough research and experimentation following Dr. Sperti's original work, LYCD has been proven to increase the rate at which cells consume oxygen. The increase in oxygen consumption is actually merely a symptom of a global increase in metabolism. Traditionally the activity of LYCD was measured using the Warburg test. The test involved the use of defatted rat abdominal skin where the oxygen consumption was measured using a manometer. Where one unit of respiratory activity is defined as the quantity of LYCD required to increase the oxygen uptake of 1 mg of tissue by 1% at the end of 1 hour. The Warburg method eventually was shown to be a good indicative measure but difficult to correlated from researcher to researcher. The modern incarnation of this assay involved the use of mouse liver cells where the oxygen consumption is measured by an oxygen electrode. This method is highly reproducible, but does rely on animal tissue. LYCD during the course of its existence has become a well-understood product, where it is generally believed that the active ingredients are a low molecular weight glycopeptides. UV absorbance at 256 nm has been closely correlated with respiratory units and is generally accepted as a non-animal alternative.

A protocol was developed to evaluate the ability of AC Dermal Respiratory Factor Advanced PF to reduce the discomfort produced by over-exposure to UV radiation. Twenty panelists (m/f 27-45) were asked to evaluate two lotions containing either AC Dermal Respiratory Factor Advanced PF (2.8% w/w) or Benzocaine (0.5% w/w). The panelists were asked to apply the products immediately following overexposure to the sun and to record their immediate perception as well as their perception after two hours. The product was evaluated for reduction in erythema and reduction in sunburn pain. The results were graded on a scale of 1 to 5 with 5 being complete reduction. Application continued for 1 week, with the product being applied twice per day. Products were weighted at the beginning and end of the study to evaluate compliance.

## Increase in Soothing Benefits

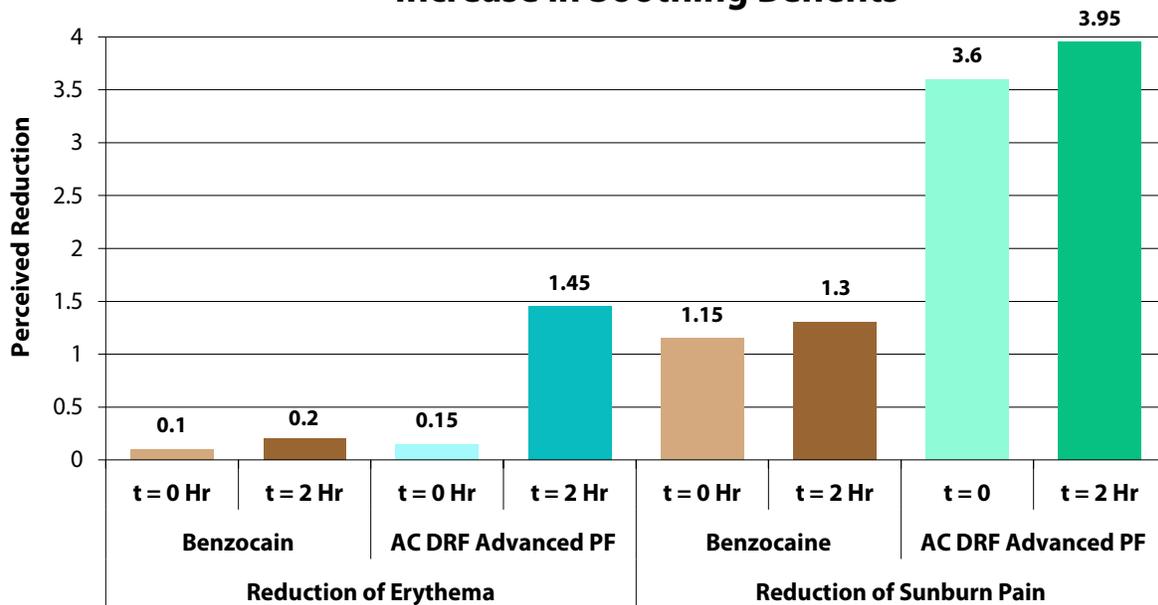


Figure 2. Comparison of test materials ability to increase cellular renewal

Topical application of AC Dermal Respiratory Factor Advanced PF is capable of producing consumer perceivable reductions in erythema and discomfort resulting from overexposure to light. It was also noted among those panelists complying with the one-week application period that there was a marked reduction in skin peeling to areas where lotion containing AC Dermal Respiratory Factor Advanced PF was applied.

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