AC Sebum Control Enzyme PF

tired of oily skin?
take control! sebum control!
hair care + controls dryness
perfect for problem skin
Anti-sebum

BACKGROUND

Oily skin and redness do not leave a flawless first impression. Sebum primarily comes from the sebaceous glands, which are in high abundance on the face, chest and shoulders. After sebum is produced, it then migrates to lipid-filled cells and is eventually secreted onto the surface of the statum corneum through the pores. Previous treatments for treating excess sebum typically involved the use of talc to absorb and mask shininess. However, talc can leave a heavy build-up on the skin, merely concealing the problem and causing clogged pores. Impacted by various conditions, the skin and scalp may become red, itchy, oily, dry and flaky. Regular moisturizing, washing and/or conditioning may not fix these problems, but actually make them worse.

SCIENCE

AC Sebum Control Enzyme PF reduces the activity of the sebaceous glands by inhibiting the activity of 5α-reductase. It will limit the amount of sebum secretion due to an astringent effect by its tannins and can prevent acne that is caused by bacterial proliferation. The enzyme 5α-reductase is accountable for the production of the androgen hormone dihydrotestosterone that generates the sebaceous glands' activation. By inhibiting 5α-reductase, we can considerably reduce the amount of sebum produced. Furthermore an astringent effect is produced by tannins because tannins are able to constrict tissues and contract the pore openings in the skin. Lastly because there is a decline in the accumulation of sebum within the pilo-sebaceous channel. This also leads to less bacterial proliferation which decreases problem skin for a healthier overall appearance.

Code Number: 20395PF

INCI Name: Butylene Glycol & Water & Spiraea Ulmaria Extract
INCI Status: Conforms
REACH Status: Compliant
CAS Number: 107-88-0 & 7732-18-5 & 84775-57-5
EINECS Number: 203-529-7 & 231-791-2 & 283-866-3

Origin: Botanical & Synthetic
Processing:
GMO Free
No Ethoxylation
No Irradiation
No Sulphonation
Additives:
Preservatives: None
Antioxidants: None
Other additives: None
Solvents Used: Butylene Glycol & Water
Appearance: Brown, Clear Liquid
Soluble/ Miscible: Water Soluble
Ecological Information: 88.45% Biodegradability
Microbial Count: <100 CFU/g, No Pathogens

Suggested Use Levels: 2.0% - 5.0%
Suggested Applications: Control Oil & Dryness, Problem Skin

Benefits of **AC Sebum Control Enzyme PF:**

- Sebum Control
- Ideal for Problem Skin
- Controls Dryness

AC Sebum Control Enzyme PF

BENEFITS

Active Concepts developed a product that controls excess sebum and is the answer to this persistent problem. **AC Sebum Control Enzyme PF** regulates the sebum on the skin and scalp to maintain a healthy balance, thus preventing overly oily or dry skin. This product is a perfect addition to skincare products with a focus on oily or dry skin, while also being a useful ingredient in haircare products, such as dry shampoos, to minimize the appearance of oily hair. **AC Sebum Control Enzyme PF** regulates sebum production and secretion so that we are not just covering up the problem but providing a solution!

EFFICACY

Reactive oxygen species (ROS) are generated by normal cellular processes, environmental stresses, and UV irradiation. ROS are dangerous 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 Sebum Control Enzyme PF**.

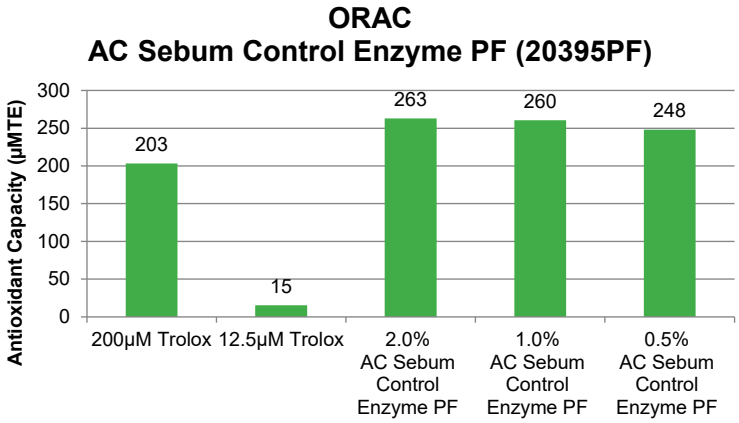

Figure 1. Antioxidant capacities for **AC Sebum Control Enzyme PF**.

As shown in Figure 1, **AC Sebum Control Enzyme PF** exhibited greater antioxidant activity than 200µM Trolox® (positive control), which was used as a reference for antioxidant capacity. The antioxidant capacity of **AC Sebum Control Enzyme PF** increased as the concentration increased, as a result we can assure that its ability to minimize oxidative stress is dose dependent. Maximizing the antioxidant capacity on a cellular level allows for ROS to be dealt with at a rate that provides protection from cellular damage.

An ROS Scavenging Assay was also conducted to assess the *in-vitro* effect of **AC Sebum Control Enzyme PF** to scavenge unnecessary oxidative stress in dermal fibroblasts. Attenuating excessive ROS preserves cellular homeostasis and blunts intrinsic and extrinsic age-related declines in skin cell function.

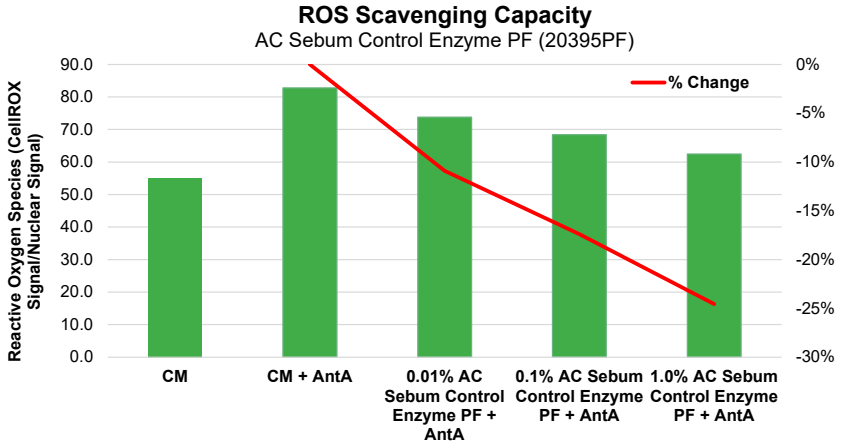

Figure 2. ROS scavenging capacities for **AC Sebum Control Enzyme PF**.

AC Sebum Control Enzyme PF

As shown in Figure 2, fibroblasts incubated with AntA, a known inducer of oxidative stress, elicited a 50% increase in ROS levels, compared to untreated fibroblasts. This data demonstrates the supraphysiologic level of ROS induced by AntA and the magnitude of ROS in fibroblasts is dynamic. Conversely, fibroblasts treated with **AC Sebum Control Enzyme PF** at 0.01%, 0.1%, and 1.0% demonstrated 11%, 17%, and 25% reductions in ROS levels compared to fibroblasts treated with AntA, respectively. This data demonstrates **AC Sebum Control Enzyme PF** attenuates excessive oxidative stress. Collectively, intrinsic and extrinsic factors perturb skin homeostasis by stimulating abundant levels of ROS that amplify DNA mutation, cellular senescence, advanced glycation end products, protein oxidation, and collagen degradation. This data indicates **AC Sebum Control Enzyme PF** scavenges unnecessary ROS, which may help to attenuate characteristics of cellular aging.

An *in-vivo* study was conducted to evaluate the ability of **AC Sebum Control Enzyme PF** to reduce facial sebum when incorporated into a base lotion. The Sebum Reduction Assay assessed the sebum reducing capability of **AC Sebum Control Enzyme PF**. 4 M/F subjects between the ages of 21 and 35 participated in the study. Results indicate that this material is capable of significantly decreasing sebum, a common problem, over time.

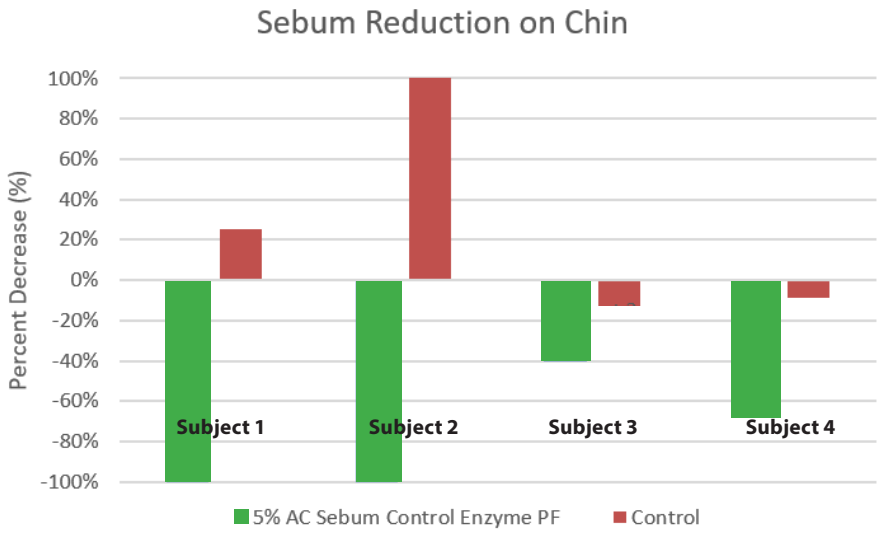

Figure 3. Percent reduction of sebum in the Chin Region for **AC Sebum Control Enzyme PF**.

The results showed that **AC Sebum Control Enzyme PF** was effective at decreasing sebum for all participants. For example, subjects 1 and 2 experienced a 100% decrease in sebum after 6 hours on the chin where subject 4 had a 68% decrease in the same area. Subject 3 experienced a 40% decrease in the chin area. **AC Sebum Control Enzyme PF** can be used as a means to mattify without dehydrating the skin to offer a smooth, sebum-free all-day complexion.

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