

TRENDS & INNOVATIONS



LactoSporin

A Dream Solution for Acne free Smooth Skin

By Shaheen Majeed



EURO COSMETICS

Shaheen Majeed, President of Sabinsa Worldwide, is responsible for manufacturing, marketing, strategies and other operational matters. He is actively involved in Sabinsa's extensive cultivation program, interacting with farmers to ensure sustainability of quality raw materials from which Sabinsa manufactures the company's high quality, proprietary ingredients. He earned a BA in Economics from Rutgers University, NJ and an MBA in Business Management from Keller Management School, CA. In 2009 Natural Foods Merchandiser magazine named him one of 40 under 40 notable members of the industry.

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Pathology of Acne

Acne is the most common exasperating skin condition in teenagers and young adults, causing emotional distress. It is characterized by excessive sebum production, inflammation, keratinization of follicles, and overgrowth of the bacteria *Cutibacterium acnes*.¹ Despite being one of the most widespread skin problems, and a hot research topic, the development of new therapeutic agents is still sluggish. Conventional agents like antibiotics, benzoyl peroxide, and retinol can cause antibiotic resistance, skin barrier disruption, leading to dryness and irritation. New treatment options targeting multiple pathologies by calming inflammation, maintaining skin moisture and barrier function along with preserving the skin microbiome with minimal side effects are essential for treating acne.²

Natural products have been the focus of skin care due to their efficacy and safety profile. Lately, the gut microbiome has been shown to have a crucial role in preserving the skin condition.³ As dietary supplements, probiotics provide health benefits by fighting pathogens and maintaining gut homeostasis and skin microbiome.⁴ The topical application of probiotic components has shown beneficial effects by modifying skin barrier function, increasing the skin's antimicrobial properties, and protecting against acne and erythema⁵⁻⁸. However, the application of live bacteria on skin poses several challenges⁹. Extracellular metabolites from probiotics, also termed as "Postbiotic," can influence the microbiome composition¹⁰⁻¹². They have a long shelf life, safety, and possess multiple health benefits. Few studies using probiotic metabolites have shown a positive effect on the skin, although cosmetic use of postbiotics is still in its infancy⁵.

Clinical study

LactoSporin is an extracellular metabolite purified from *Bacillus coagulans* MTCC 5856 fermented broth with an INCI name Bacillus Ferment Filtrate Extract. LactoSporin acts as an antimicrobial agent by lowering the pH, inhibiting microbial biofilms, and draining the ions from the targeted cells^{13, 14}. In a randomized clinical trial, 64 male and female subjects with mild to moderate acne were treated with a 2% LactoSporin cream for 21 days in comparison with 2.5% benzoyl peroxide. The efficacy parameters were evaluated based on the dermatologist visual assessment and instrumental measurement using and subject self-assessment questionnaires. Adverse events were recorded throughout the study period.

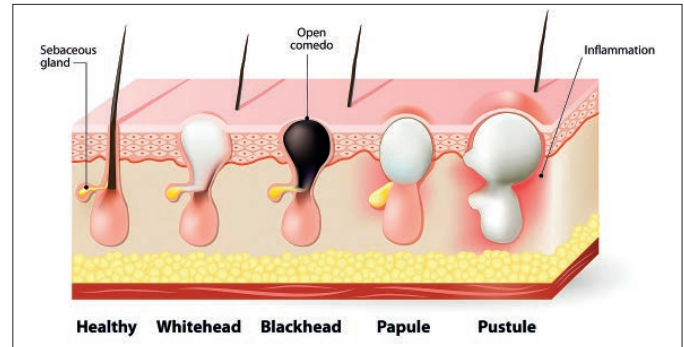


Figure 1: Types of Acne

Assessment of acne lesions

The inflammation was recorded using the instrument "Antera" by the dermatologist. Both LactoSporin and benzoyl peroxide

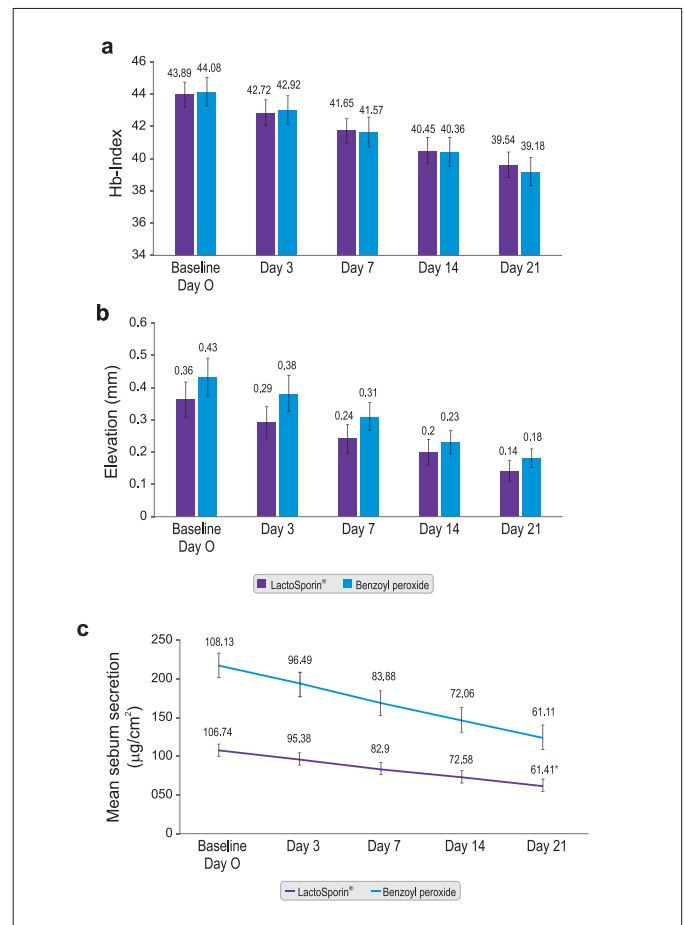


Figure 2: Antera analysis was conducted on day 0 to day 21. **A:** Redness (Hb-index- % hemoglobin hyper-concentration) in inflammatory response **B:** Elevation (Small) in the inflammatory response, **C:** Analysis of sebum secretion ($\mu\text{g}/\text{cm}^2$) by Sebumeter

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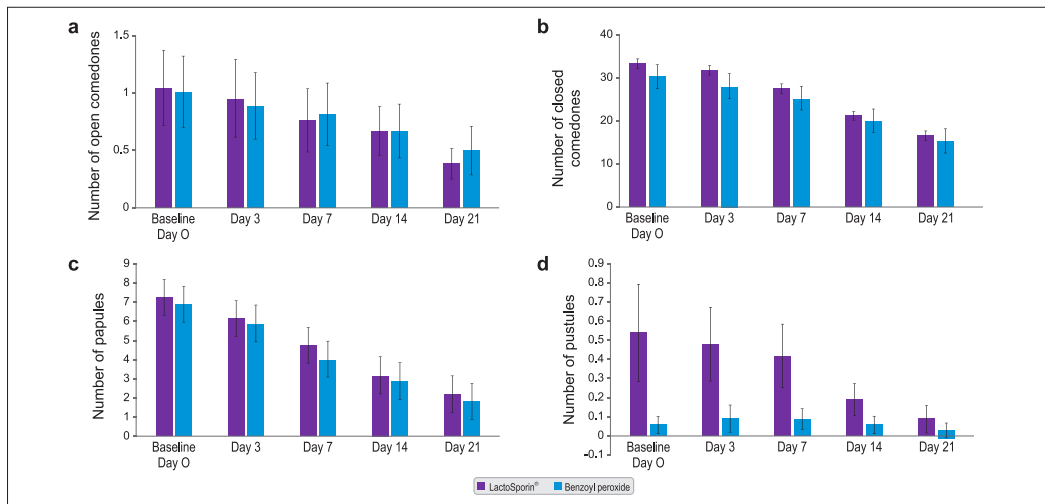


Figure 3: Dermatological Assessment: **A:** Count of open comedones, **B:** Count of closed comedones, **C:** Count of Papules, **D:** Count of Pustules

showed a reduction in inflammation as early as three days after application. The small and medium elevation reduced significantly ($p < 0.001$) by 61.11% and 60.93% in the LactoSporn group and 58.14% and 54% in the benzoyl peroxide group (Fig. 2A and B). Application of 2% LactoSporn cream resulted in a significant reduction in sebum secretion at all time points with a 42.4% reduction at the end of the study (Fig. 2C). The results were comparable to the standard treatment of benzoyl peroxide (43.4% reduction).

Dermatological Assessment

The dermatological assessment was performed by counting the inflammatory (papules and pustules) and non-inflammatory (open and closed comedones) lesions. The mean number of open comedones reduced from 1.03 ± 1.82 to 0.38 ± 0.75 with 63.11% reduction for LactoSporn and 1.00 ± 1.74 to 0.50 ± 1.16 with 50.0% reduction for benzoyl peroxide group. Similarly, the closed comedones reduced by 50.02% in the LactoSporn and 49.50% for the benzoyl peroxide group (Fig. 3A – D).

The application of both LactoSporn and benzoyl peroxide showed a statistically significant reduction in oil and grease from the face compared with their respective baseline from Day 3 onwards. LactoSporn was better than benzoyl peroxide in improving oily and greasy skin look throughout the study period.

LactoSporn was found to be safe as no adverse effects or local intolerance were observed during the study. None of the subjects reported skin irritation as assessed by the subject self-assessment questionnaire.

Conclusion

LactoSporn showed better efficacy than benzoyl peroxide for reducing the sebaceous secretion and oily greasy nature of the skin, suggesting that the ingredient is effective in seborrheic conditions. In all other parameters studied, LactoSporn was equivalent to the standard treatment of benzoyl peroxide in the management of mild to moderate acne lesions. Further, we have recently reported the efficacy of LactoSporn as a skin-protecting agent based on *in vitro* studies¹⁵. These results suggest that this

extracellular metabolite from *B. coagulans* MTCC 5856 could be a dream solution for acne-free smooth skin.

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