

Effect of A Seboregulating Shampoo on Dogs with Oily Skin: An Open Pet-Owners Evaluation

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Abstract

Keratinisation disorders in dogs lead to excessive skin greasiness, scale formation, and malodour, significantly impacting their quality of life. Traditional treatments using sulfur and salicylic acid have limitations, prompting interest in alternatives. This study evaluates the clinical effectiveness and practical aspects of a new perfume-free seboregulating shampoo, Keratoderm®, containing cider vinegar, lactic acid, and tea tree leaf oil, and enriched with moisturisers and soothing agents. In an open-label evaluation, 20 dogs with oily and scaly skin were washed weekly for 4 weeks with the seboregulating shampoo. Pet owners assessed pruritus (PVAS) and six clinical signs (scaling, skin odour, skin greasiness, haircoat quality, coat shining, coat softness) at days 0, 7, and 28. The keratoseborrhoeic index (KSI) was calculated by adding each individual clinical signs, and product characteristics were rated at the study's end. PVAS significantly decreased from day 0 (7.2 ± 1.8) to day 28 (3.1 ± 2.7). Significant improvements in all individual clinical signs and in KSI were observed by day 7, with further improvement by day 28. Owners reported high satisfaction and no adverse events were reported. The shampoo demonstrated rapid reduction of pruritus and clinical signs, as soon as day 7, in dogs with oily skin, offering a well-tolerated, fragrance-free alternative for managing seborrhoeic conditions. Future controlled studies with larger samples are recommended to confirm these findings and optimise usage protocols.

Keywords: Keratoseborrhoea, Dog, Shampoo, Cider Vinegar, Perfume-Free

1. Introduction

Keratinisation disorders in dogs often present as secondary manifestations of a variety of primary skin diseases, leading to significant discomfort and reduced quality of life. These disorders disrupt the normal cycle of keratinocytes, resulting in excessive skin greasiness and scale formation, conditions frequently accompanied by unpleasant skin odours.

Effective management of these conditions relies heavily on topical therapies that can address both the symptomatic relief and the underlying pathophysiological imbalances. Seborrhea, characterised by an overproduction of sebum, can lead to oily, scaly skin and is a common presentation in veterinary dermatology [1]. Traditional treatments have included shampoos with ingredients such as sulfur and salicylic acid, which target the hyperkeratotic and seborrhoeic aspects of the disorder. However, these treatments can have limitations, including potential irritation and unpleasant odours that may be off-putting to both pets and their owners.

In recent years, there has been a growing interest in more holistic and less irritating alternatives. Natural ingredients with astringent, keratolytic, and antimicrobial properties are being increasingly incorporated into topical formulations. Lactic acid is well-known for its keratolytic effect allowing to modulate keratinocyte proliferation and helping to eliminate flaky skin [2,3]. Cider vinegar is an astringent traditionally used for oily skin, with purifying and exfoliating properties [4]. Tea tree leaf oil is used for decades in veterinary dermatology for its antimicrobial properties [5]. Tea tree leaf oil purifies and neutralises odours.

A new seboregulating shampoo, Keratoderm®, has recently been marketed in Europe. This fragrance-free and sulfur-free formula contains cider vinegar, lactic acid, and tea tree leaf oil. These ingredients are combined with a novel technology designed to manage the skin barrier. The Skin Barrier Protect™ technology provides a moisturising effect through glycerine and shea butter [6-10], ensuring the skin remains hydrated. Additionally, soothing agents such as *Centella asiatica* extracts

and B vitamins are included to offer rapid relief, addressing both immediate discomfort and long-term skin health. The technology also has long-term benefits on the skin barrier itself: *Asparagopsis armata*, a biologically active algae, helps restructure skin cells [11-16]. Finally, it reinforces the skin barrier with a lipid matrix mimicking the skin's composition, including squalane, ceramide 3, phytosterols, fatty acids, triglycerides, and phospholipids [17-19].

This open-label, pet-owner evaluation aimed to assess the clinical effectiveness and practical aspects of Keratoderm® shampoo when used on privately-owned dogs with oily and scaly skin. By involving pet owners in the evaluation process, the study also seeks to gather valuable insights into user satisfaction and the real-world applicability of this new product format.

2. Materials and Methods

Twenty dogs with oily and scaly skin were included. Dogs were washed once a week for 4 weeks with Keratoderm® shampoo (MP Labo, France) containing cider vinegar, an astringent traditionally used for oily skin, lactic acid, with keratolytic effects, and tea tree leaf oil, to purify and neutralise odours. The shampoo also incorporates moisturisers (glycerin and shea butter), soothing agents (*Centella asiatica* and B3 vitamins), and algae rich in biologically active silicium associated with biomimetic lipids to reinforce the skin barrier.

On D0, D7 and D28, pet-owners evaluated pruritus (PVAS scale from 0-10) [20] and 6 individual clinical signs scaling, skin odour, skin greasiness, haircoat quality, coat softness on a 0-4 scale (0 =

very good ; 4 = very bad) adapted from Kondrajteva [21]. The sum of individual scores was calculated to define a keratoseborrhoeic index (KSI).

At the end of the study, owner assessment rated product's characteristics (aesthetics, ergonomics, smell, ease of use, foaming power, effectiveness) and gave a global satisfaction level (0-10 ; 0 = very bad ; 10 = very good).

The comparison of clinical scores over time (D0, D7 and D28) was carried out using a generalised linear mixed effects model (fixed effect: time and random effect: animal). In case of significance, post-hoc tests were carried out using Fisher's Least Significant Difference (LSD) tests.

3. Results

Analysis was made on 18 dogs with complete data (10 females and 8 males, with a mean age of 7.4 years old [1-16]). All dogs had a skin greasiness index above 3 or above 2, with 2 other signs above 3. PVAS significantly decreased on D7 (4.2±2.3) and D28 (3.1±2.7) compared to D0 (7.2±1.8). On D28, 67% of dogs had more than a 50% decrease, and 11% more than a 90% decrease.

All individual scores were significantly improved as soon as D7 with a subsequent improvement on D28 for greasiness and coat shining. KSI was significantly improved from D0 (16.7±3.9) to D7 (8.9±3.9) and from D0 to D28 (6.8±2.8) (Table 1). An improvement of the haircoat was reported by 100% of owners on D28.

	D0	D7	D28	p- value
Scaling	3.0 [2-4]	1.4* [0-3]	1.3* [0-3]	< 0.0001
Skin odour	2.9 [2-4]	1.4* [0-3]	1.2* [0-3]	< 0.0001
Skin greasiness	3.0 [2-4]	1.5* [0-3]	0.9*§[0-3]	< 0.0001
Haircoat quality	2.4 [1-4]	1.3* [0-3]	0.9* [0-2]	< 0.0001
Coat shining	2.9 [1-4]	1.9* [1-3]	1.4*§ [1-2]	< 0.0001
Coat softness	2.4 [1-4]	1.4* [0-3]	0.9* [0-2]	< 0.0001
Keratoseborrhoeic index	16.7 [10-24]	8.9* [3-15]	6.8* [2-11]	< 0.0001

Table 1: Mean individual clinical scores and KSI over time [minimum - maximum].

*Statistical differences versus D0, § statistical differences versus D7.

The global satisfaction level was 8.8 and all product's characteristics were rated above 8.5, with very good ease of use (9.1) (Table 2).

	Note [0-10]
aesthetics	8.5 [5-10]
ergonomics	8.6 [4-10]
smell	8.7 [7-10]
ease of use	9.1 [5-10]
foaming power	8.8 [7-10]
effectiveness	8.8 [5-10]

Table 2: Mean scores of product's characteristics [minimum – maximum]

The shampoo was well tolerated with no adverse event reported.

4. Discussion

The findings from this study indicate that the new seboreregulating shampoo, Keratoderm®, is interesting in reducing pruritus and improving clinical signs associated with oily and scaly skin in dogs. Keratinisation disorders can be defined as an abnormal keratinisation of the epidermis (scaly skin) and/or an abnormal function of sebaceous glands (oily skin). Common causes include genetic factors, hormonal imbalances, and underlying skin diseases such as parasitic diseases, atopic dermatitis, or hypothyroidism. Environmental factors, poor nutrition, and inadequate grooming can exacerbate these conditions [1]. One limitation of the study is that recruitment was based on clinical signs evaluated by the dog owner, without any medical diagnosis performed by a veterinarian. Management of keratinisation disorders is primarily based on topical therapy. Keratolytic agents promote the removal of *stratum corneum* cells, thereby reducing scales. Keratoplastic agents help normalise keratinisation by slowing down the multiplication of basal cell layers. Traditional keratomodulating agents include sulfur and salicylic acid. An alternative consists of using alpha-hydroxy acids, such as lactic acid, which are extensively used in human cosmetic formulations as superficial peeling agents and to improve the appearance of keratoses [2]. Anti-seborrhoeic agents aim to reduce the excessive production of sebum by the sebaceous glands. Selenium sulfide is known for its degreasing activity. Apple cider vinegar is a natural, vegan product that has been shown to have powerful antimicrobial activity [4] and is traditionally used for oily skin in humans. However, its effect on oily skin in dogs has not been demonstrated so far.

The assessment of clinical signs in this study is adapted from Kondratjeva et al. In their research, the authors employed a clinical score derived from four clinical parameters (malodour, scaling, greasiness, haircoat quality) and an additional extension score, utilising a 0 to 3 scale [21]. In our current study, we expanded upon this by incorporating six clinical parameters (including coat shining and coat softness) rated on a 0 to 4 scale, and removing the extension score. The use of a five-point scale offers increased granularity, allowing for more precise distinctions in severity. Furthermore, a five-point scale version exhibited improved data quality, with fewer missing data points, reduced end effects at both the item and scale levels, and higher levels of internal consistency versus a four-point scale version [22].

The fragrance-free formulation is particularly advantageous for dogs with sensitive skin or those prone to adverse reactions from fragranced products. In human medicine, allergic contact dermatitis caused by fragrances is common, with a prevalence of fragrance allergy in the general population ranging from 0.7% to 2.6% [23]. Owner-reported outcomes further validate the product's effectiveness and ease of use. High satisfaction ratings in aspects such as aesthetics, ergonomics, smell, ease of use, foaming power, and overall effectiveness underscore the product's acceptability in a real-world setting. The high global satisfaction level (8.8) and the lack of reported adverse events reinforce the safety and tolerability of the shampoo.

Even though the shampoo was used only once a week for 4 weeks, a significant improvement was observed in pruritus visual analog scale scores and individual clinical signs. The rapid improvement noted as early as day 7 highlights the potential of this shampoo to offer quick relief, which is crucial for enhancing the quality of life for affected dogs and their owners. By day 28, the continued improvement in clinical scores, including the keratoseborrhoeic index (KSI), supports the sustained efficacy of the product with regular weekly use. Exploring the optimal frequency of use tailored to the severity of clinical signs in individual patients could further enhance the practical utility of the shampoo.

The study's design, while robust in demonstrating initial effectiveness, has limitations that should be addressed in future research. The open-label nature and the relatively small sample size limit the generalisation of the results. A larger, controlled study would provide more definitive evidence of the shampoo's efficacy and safety profile. Future studies with larger cohorts and controlled designs are warranted to confirm these findings and to optimise treatment protocols for clinical use.

5. Conclusion

The seboreregulating shampoo had a good tolerance and ease of use profile on a weekly use for 4 weeks. It demonstrated an effect to reduce pruritus and clinical signs in dogs with oily skin. The combination of sebomodulating and keratomodulating agents with moisturisers and skin barrier protectors contributed to the rapid effect – as soon as 7 days. The fragrance-free formula could be beneficial for dogs with skin disorders and had a positive effect on skin malodour. The results should be confirmed in a controlled study with a larger population of dogs. The frequency of use of the shampoo should be adapted to the severity of clinical signs in each individual patient.

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