

PYO[®]
— Range —



**NATURAL TOPICAL SOLUTIONS TO HELP MANAGE
CUTANEOUS MICROBIAL IMBALANCES**



**TRENDSETTING
INNOVATIONS
SINCE 2003**



**SCIENTIFICALLY
PROVEN
EFFICACY**



**EASE OF USE
FOR HIGH
COMPLIANCE**



Naturally efficient



CUTANEOUS INFECTIONS:

AN IMPORTANT PART OF DERMATOLOGICAL CONSULTATIONS

THE SKIN, A COMPLEX AND FRAGILE ECOSYSTEM:

The superficial layers of healthy skin are colonized by *multiple micro-organisms* (bacteria, fungi, etc.) that **form the cutaneous flora** (or microbiota).

Once the fragile balance of the microbiota is altered, **pathogenic bacteria** can abnormally proliferate (pyoderma).

Yeasts can also multiply and **lead to infection** (e.g. *Malassezia pachydermatis* dermatitis).

PYODERMA, A FREQUENT REASON FOR CONSULTATION

Pyoderma is a major cause of dermatoses in dogs and can account for 25% of canine dermatological consultations.¹

PYODERMA CAN BE DIFFICULT TO MANAGE

- The treatment of pyoderma is lengthy and demanding.
- **Recurrences** are frequent.
- Certain bacteria (in particular *S. pseudintermedius*) have the capacity to form a **biofilm** that protects them from natural skin defenses mechanisms and even antibiotics.
- Inappropriate or lengthy use of antibiotics can result in **multi-resistant bacteria**.

In case of cutaneous infections, **it is advised to wear gloves** while manipulating the animal in order to avoid potential contamination from pathogenic agents.



YOU CERTAINLY KNEW

Several factors can destabilize skin flora and promote the development of cutaneous infections.

- **Anatomic predisposition** (presence of folds, obesity...)
- **Pathologies** (allergic dermatitis...)
- **Iatrogenic factors** (corticosteroids, inadequate anti-infectious therapy...)
- **Hygienic factors** (insufficient cleansing, excessive licking...)
- **Histological factors** (thin *stratum corneum*, damaged hydrolipidic film...)

It is essential to integrate safe & effective topical solutions to the therapeutic arsenal.

1. E. Bensignor, Atlas des Pyodermes Canines, 2nd Ed. 2011; p11.

THE INTEGRITY OF THE CUTANEOUS BARRIER AND THE BALANCE OF THE SKIN FLORA ARE TOP PRIORITIES

ESSENTIAL FATTY ACIDS (EFA)
ARE INDISPENSABLE IN MAINTAINING A FUNCTIONAL SKIN BARRIER

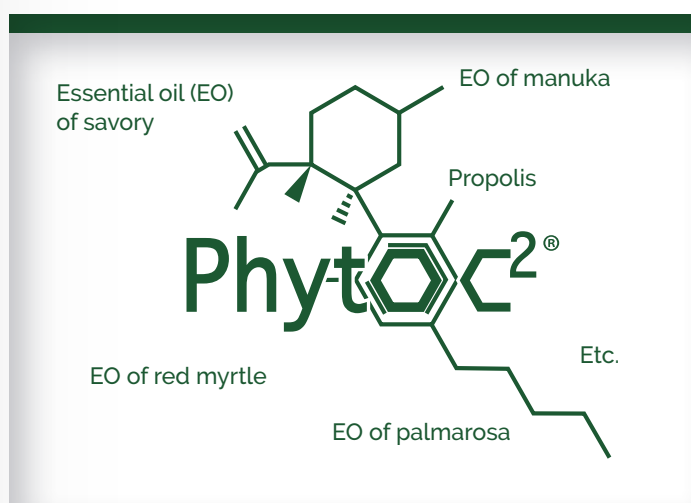
■ EFA HELP MAINTAIN THE EPIDERMAL CELLULAR COHESION

- To form an impermeable barrier against the aggressions from the environment (allergens, bacteria, pollution, etc.).
- To preserve skin hydration

EFA cannot be synthesized by the body and have to be provided by external sources.

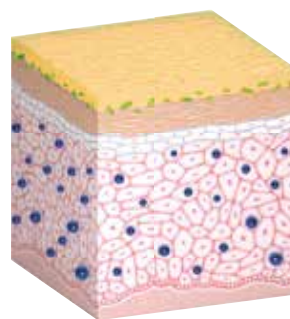
PhytoC-2®: COMPLEX TO HELP REBALANCE THE MICROBIOTA

A tailor-made natural complex with purifying properties adapted to each formulation of the PYO range.



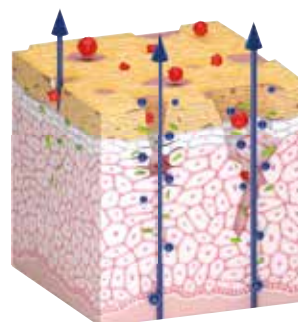
PYORANGE: HELPS LIMIT MICROBIAL IMBALANCES AND PROMOTE SPARING EFFECT

Intact cutaneous barrier



- ✓ Intact lipid layer
- ✓ Preserved flora
- ✓ Impermeability
- ✓ Cohesion between the cells
- ✓ Sufficient and optimal intercellular lipids
- ✓ Limited transepidermal water loss

Impaired cutaneous barrier



- ✓ Damaged lipid layer
- ✓ Multiplication of pathogenic bacteria and yeasts
- ✓ Penetration of allergens
- ✓ Loss of cohesion between the cells
- ✓ Insufficient intercellular lipids
- ✓ Dehydration

PYOSPOT®: PURIFYING SPOT-ON



Purifying ingredients:

- Essential oils of palmarosa and savory
- Neem and ajowan extracts

Soothing ingredients:

- Essential oils of lavandin and lemon eucalyptus
- Tamanu oil

Moisturizing and cutaneous barrier repairing ingredients:

- Hemp seed and tamanu oils: rich in EFA

Directions for use:

1 pipette per week as long as necessary



Quick and easy application to promote compliance

Evaluation of Drs. Noli, Oliveira *et al.*

Protocol

- **25 dogs** with at least 3 episodes of pyoderma per year
- 1 application of **PYOspot®** per week
- Follow-up of the number of relapses during 6 to 12 months

Results

- Mean number of relapses per year:

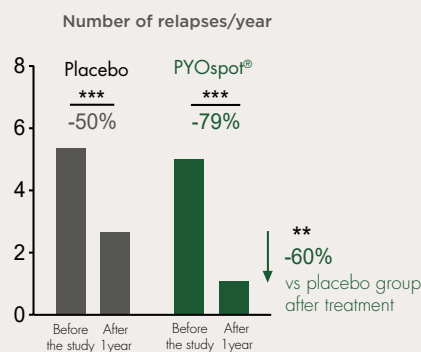
Before the study **4,5** After the study **1,3**

Evaluation of Drs. Fadok, Mueller *et al.*²

Protocol

- **26 dogs** with at least 4 episodes of pyoderma per year
- 1 weekly application of **PYOspot®** or placebo
- Follow-up of the number of relapses during 1 year

Results



2. V. Fadok, F. Seckerdiekt, E. Bensignor, C. Noli, A. Oliveira et R. Mueller. Topical application of a proprietary blend of essential oils and plant extracts (PYOspot®) is associated with fewer relapses of pyoderma, Poster WCVD 2020. Abstract: Veterinary Dermatology (Oct 2020), 31(Suppl. 1), p55.

PYOCLEAN® SPRAY: PURIFYING SPRAY



50 ml



Purifying and antibiofilm ingredients:

- Essential oils of manuka & lavandin
- N-acetylcysteine

Rebalancing ingredient:

- Patented oligosaccharidic prebiotic agent

Soothing, hydrating and cutaneous barrier repairing ingredients:

- Hemp seed oil: rich in EFA
- Allantoin

Directions for use:

Twice a day



Antibiofilm ingredients, thixotropic texture

In vitro activity - Dr. Bensignor, et al.³

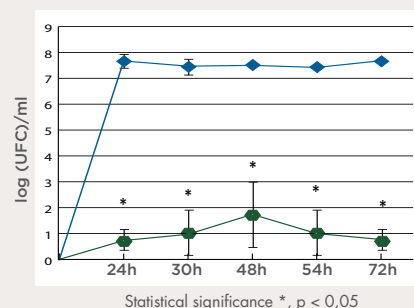
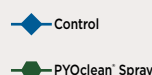


Protocol

- Follow-up of **biofilm formation** over 72h and of **mature biofilm** over 4h with the application of **PYOClean® Spray** or sterile distilled water as a control

Results

Effect of PYOClean® Spray on biofilm formation of *S. pseudintermedius*

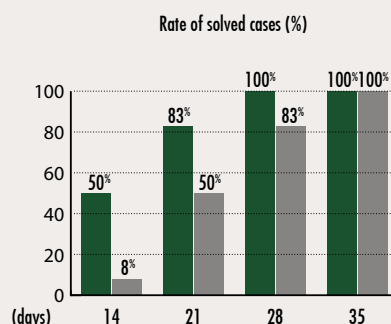


Evaluation of Dr. Bensignor, et al.⁴

Protocol

- **12 dogs** with a superficial pyoderma
- Systemic treatment: **cefalexin** (15 mg/kg twice a day) in association with **PYOClean® Spray** on half of the body and a **placebo** spray on the other half
- Duration: **4 weeks**
- Follow-up of case resolution on D14, D21, D28 et D35

Results



Hind limbs
after 14 days:

PYOClean® Spray



Placebo



3. C. Feuillolay, E. Bensignor, L. Fabriès, R. Andriantsalama, C. Roques. In vitro antibiofilm properties of topical products containing N-acetylcysteine and natural components derived from plants, posters ESVD 2018 and NAVDF 2019.

4. E. Bensignor, et al. A split-body, randomized, blinded study to evaluate the efficacy of a topical spray composed of essential oils and essential fatty acids from plant extracts with antimicrobial properties, poster WCVD 2016. Published in Veterinary Dermatology (Dec 2016), 27(6): p. 464-467.

PYOCLEAN® SHAMPOO: PURIFYING SHAMPOO



200 ml



Cleansing ingredient:

- Lipoamino acids of green apple

Purifying and soothing ingredients:

- Essential oils of oregano and manuka
- Propolis
- Honey

Hydrating and cutaneous barrier repairing ingredient:

- Hemp seed oil: rich in EFA

Directions for use:

Once to several times a week



Does not irritate nor dehydrate the skin⁵

Evaluation of Drs. Duangkaew, Larsuprom, et al.⁶



Protocol

- **20 dogs** with 3-4 localized lesions of superficial pyoderma (16 dogs ended the study)
- 1 shampoo per week with **PYOclean® Shampoo** and application of **PYOspot®** 48h after
- Duration: **8 weeks**
- Evaluation of the improvement of the lesions and pruritus

Results

Lesions: - **77,5%** | Pruritus: - **83,5%**



PYOCLEAN® MOUSSE: RINSE-FREE CLEANSING AND PURIFYING FOAM



150 ml



Cleansing and deodorizing ingredients:

- Lipoamino acids of green apple
- Saponaria root extract
- Lichen extract

Purifying and antibiofilm ingredients:

- N-acetylcysteine
- Essential oils of manuka and lavandin
- Propolis

Soothing ingredients:

- Honey
- Essential oil of lavandin
- Allantoin

Hydrating and cutaneous barrier repairing ingredients:

- Glycerin of vegetable origin
- Hemp seed oil: rich in EFA

Directions for use:

Twice a week



Easy to use
Antibiofilm ingredients

5. O. Fantini, M. Mosca, L. Verrot, G. Noel, D. Pin. Comparison of the moisturizing power and the effect on transepidermal water loss of two shampoos on canine skin barrier, poster WCVD 2016. Abstract : Veterinary Dermatology, Vol 27, p31.

6. I. Duangkaew, L. Larsuprom, C. Chen, S. Torres, et C. Lekcharoensuk. Interest of a mixture of essential oils and a plant based extract for management of localized superficial pyoderma in dogs: an open label pilot study, poster WCVD 2016. Published in Thai Journal of Veterinary Medicine [Dec 2017], 47(4): p. 513-522, open access.

Evaluation of Drs. Romero, Sheinberg, et al.⁷

Protocol

- **30 dogs** with signs of superficial pyoderma assigned to 3 groups:
 - Group 1: **PYOclean® Shampoo** twice a week & **PYOclean® Mousse** once a day
 - Group 2: **PYOclean® Shampoo** twice a week & **PYOclean® Spray** once a day
 - Group 3: Medical shampoo containing chlorhexidine, miconazole and microsilver (**Biohex® Vetbiotek, USA**) twice a week
- Duration: **14 days**
- Evaluation criteria: cytological, lesion and pruritus scores

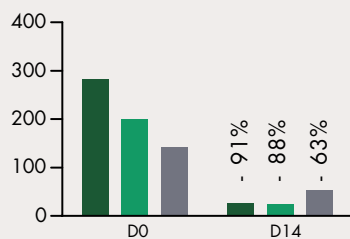
Results

■ PYOclean® Shampoo + PYOclean® Mousse ■ PYOclean® Shampoo + PYOclean® Spray ■ Biohex® shampoo

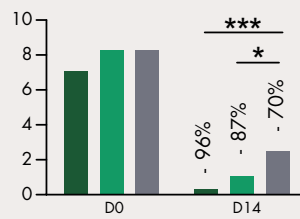
- Cytological score:

Cocci -93% -93% -81% Yeasts -82% -92% -90%

Lesion score



Pruritus score



Statistical significance *, $p < 0.05$; ***, $p < 0.001$

7. C. Romero, G. Sheinberg, A. M. Cordero et al. Meridia. Efficacy of proprietary formulations containing essential oils and plant extracts compared to chlorhexidine and miconazole shampoo in canine superficial pyoderma, Poster WCVD 2020. Abstract: Veterinary Dermatology (Oct 2020), 31(Suppl. 1), p60.

WHY INCLUDE THE PYO RANGE IN YOUR CARE PROTOCOL FOR THE MANAGEMENT OF MICROBIAL IMBALANCES?

- To help **purify the skin**
- To promote the **cutaneous barrier repair** and contribute to restore the **balance of the skin microbiota**
- To help soothe and hydrate the skin

REACTIVE CARE

Medicated treatments
(antibiotics, antifungals, oclacitinib...)

In association with **PYO range**
Natural topical solutions - **Chlorhexidine-free**



PROACTIVE CARE



As long as
necessary

+
& whenever
needed

OTITIS EXTERNA?

PYOCLEAN® OTO: PURIFYING EAR CLEANSER



- Ceruminolytic, purifying, antibiofilm and soothing natural ingredients^{3,8,9}
- Single-doses to limit risk of cross contamination between ears

8. C. Pressanti, MC, et al. Cadiergues. Efficacy of a natural ear cleanser in dogs with erythematous-ceruminous otitis externa or abnormal epithelial migration, poster AFVAC 2012.

9. A. Martin Cordero, et al. Clinical and microbiological comparison of antimicrobial and ceruminolytic activity of two commercial ear cleaners (Epitotic® advance, VIRBAC) (PYOClean® Oto, LDCA) utilizing blinded otoscopic digital imaging, poster WVCVD 2016. Abstract: Veterinary Dermatology [2016], 27 (suppl. 1), p106-107.

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