

# Assessment of the hydrating capacity of two topical formulas by Time-Domain Nuclear Magnetic Resonance on canine skin explants

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## INTRODUCTION

Classical methods for assessing skin hydration, like the corneometer, only measure surface hydration but provide no deeper insight. Innovative human dermatology techniques like Time-Domain Nuclear Magnetic Resonance (TD-NMR) offer more in-depth information.

## OBJECTIVE

Our objective was to characterise by TD-NMR the hydrating properties of two topical formulas: ATOP 7<sup>®</sup> Hydra Cream and ATOP7<sup>®</sup> MAX hydra (Dermoscent<sup>®</sup>, Nextmune, Castres, France) on canine skin explants.



## MATERIALS & METHODS

12 canine skin explants (0.5 cm<sup>2</sup>) were collected from the back of healthy Beagle dogs and divided into 3 groups (n=4):

- control (dry brush)
- ATOP 7<sup>®</sup> MAX hydra (application of 1 mg per explant)
- ATOP 7<sup>®</sup> Hydra Cream (application of 1 mg per explant).

Skin hydration was assessed before and 30 minutes after application using TD-NMR methods (20 mHz), by measuring:

- ❖ Total water proton quantity
- ❖ Water proton compartmentalisation within the skin: very bound (constitutive water), bound (hygroscopic effect), and very free water (extracellular water).



## RESULTS

### • Total water proton quantity

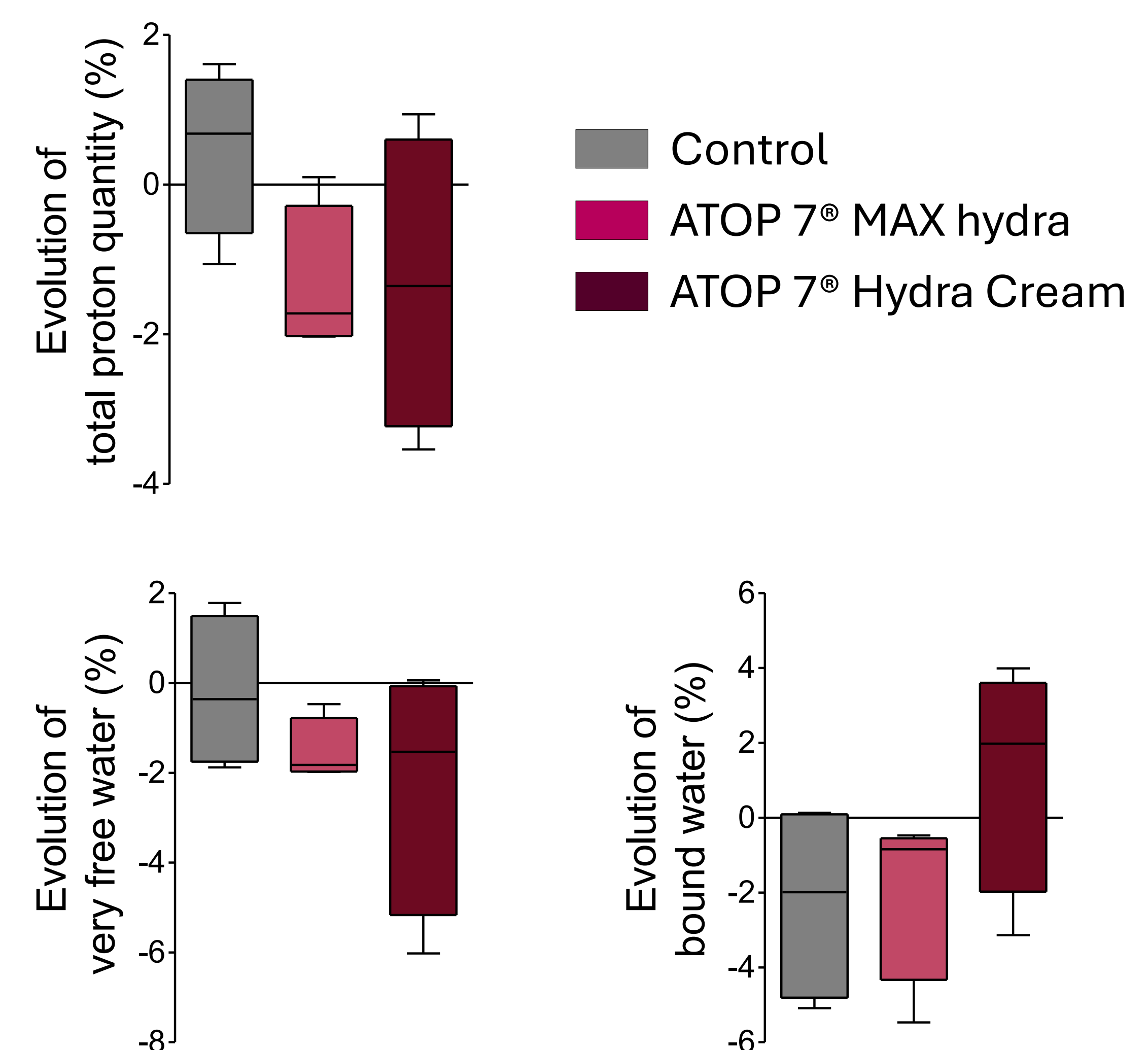
After application of the two topical formulas, total proton quantity tended to decrease.

**This result is characteristic of a “masking” effect of the constitutive water of the explants, due to the lipidic content of the topically applied formulas. ATOP 7<sup>®</sup> Hydra Cream and ATOP7<sup>®</sup> MAX hydra offer a barrier effect to maintain deep epidermal hydration.**

### • Water compartmentalisation in the skin

After application of the two topical formulas, water compartmentalisation changed compared to control with a reduction of very free water to the benefit of bound water.

**These results indicate enhanced water retention within the skin after application of the formulas.**



Data are expressed as median with interquartile ranges.

## CONCLUSION

**This pilot study pioneers a novel and elegant model to assess canine skin hydration by TD-NMR. The amplitude and range of water distribution changes align with successful hydration on human skin studies, confirming the tested product's hydrating effect.**

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