

# Speed and amplitude of diffusion assessment of a spot-on based on natural ingredients in a dog model of tape stripping

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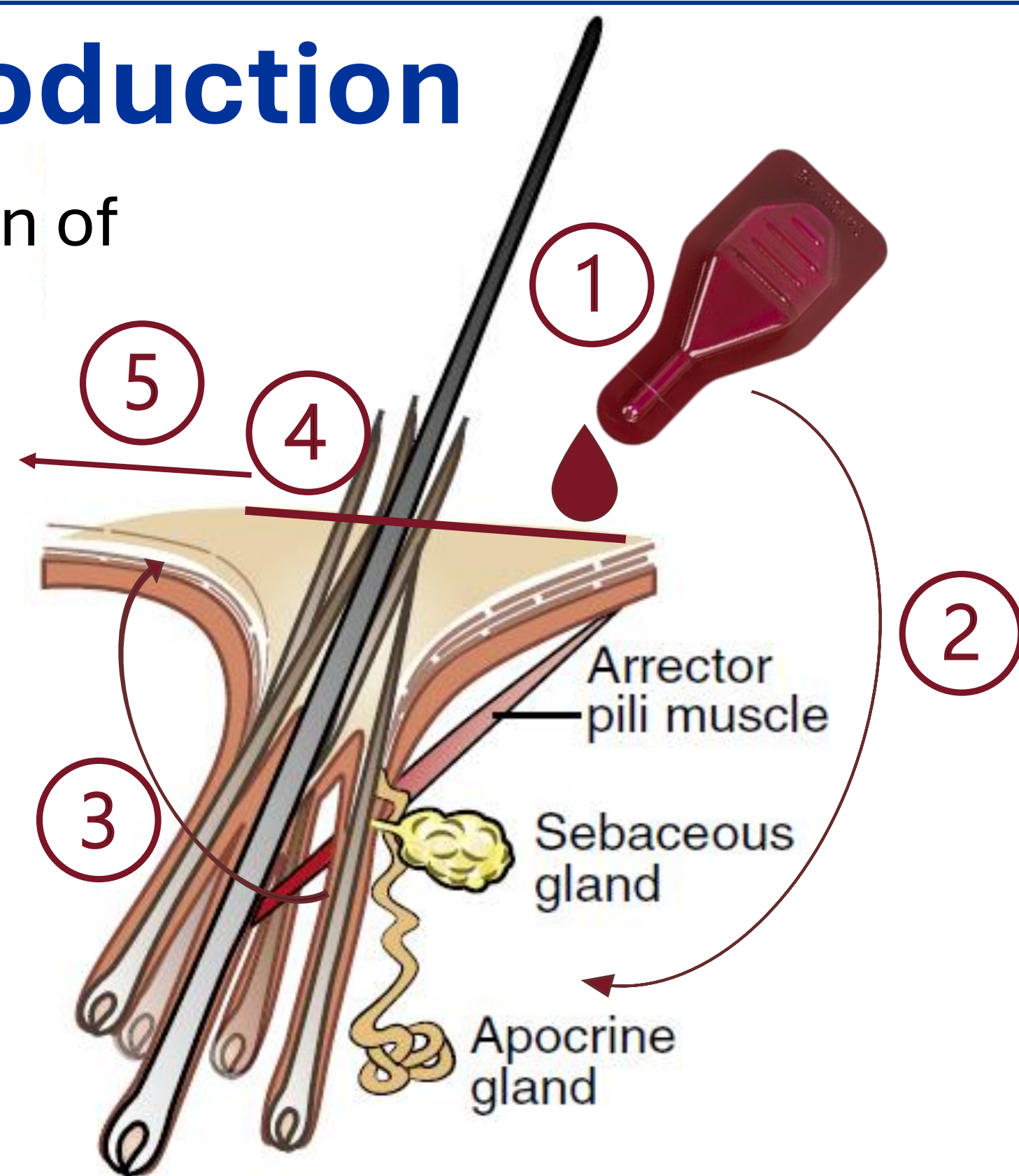
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## 1. Introduction

Supposed mechanism of action of ATOP 7<sup>®</sup> spot on:

1. Absorption of the spot-on
2. Storage
3. Gradual Release
4. Barrier enhancing effect with decreased transepidermal water loss (TEWL) value
5. Diffusion?

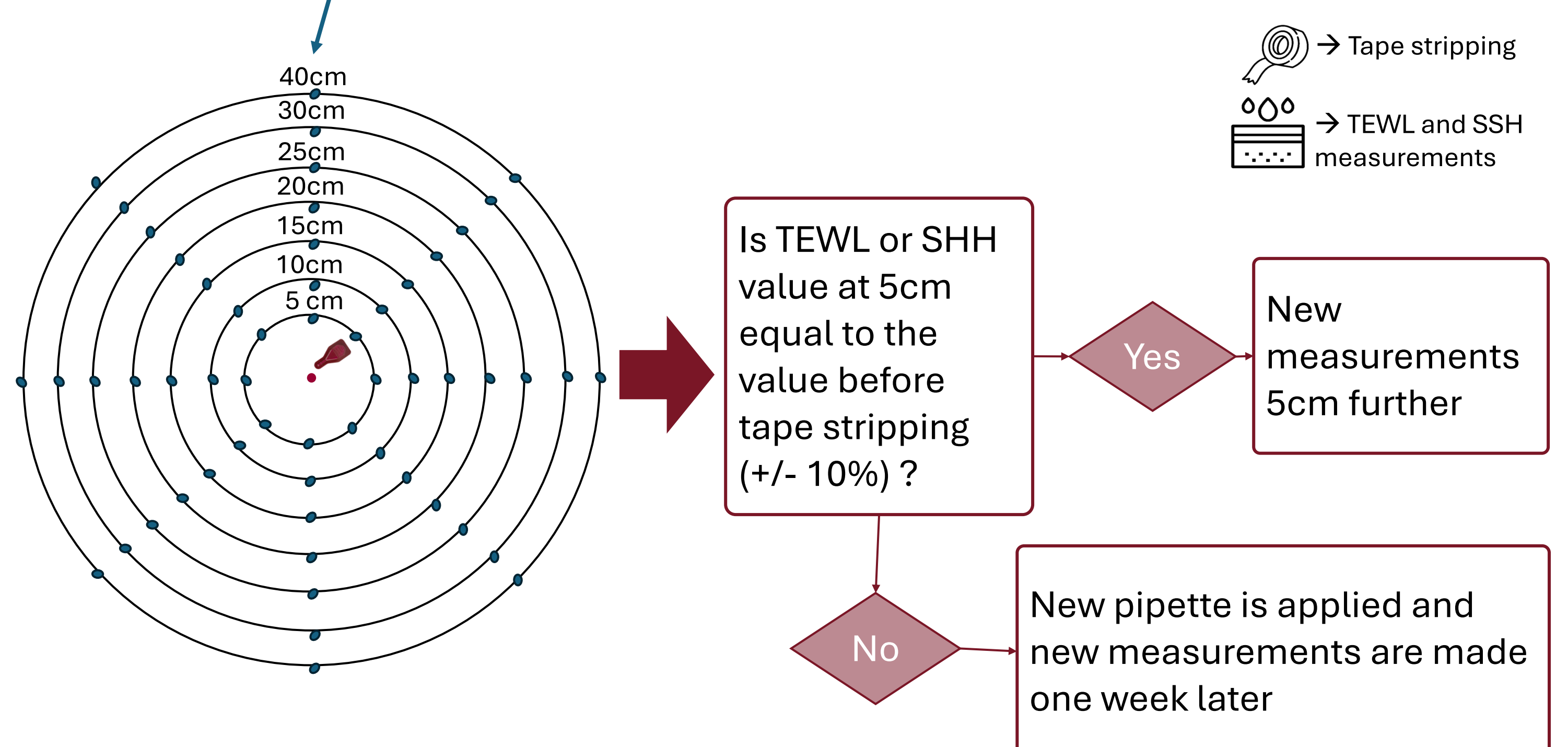
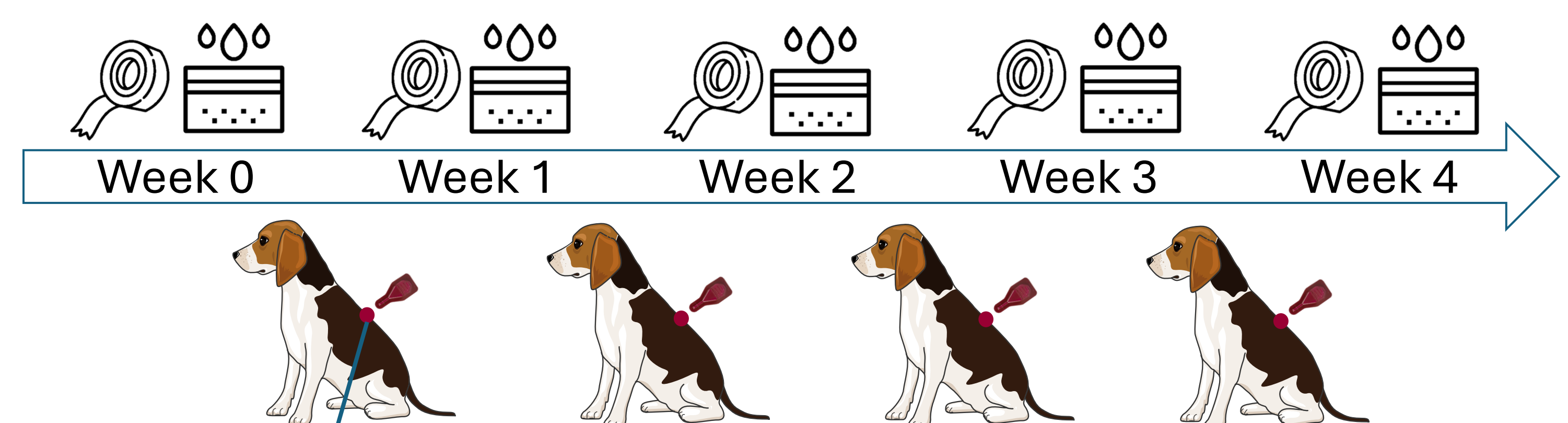


### Hypothesis:

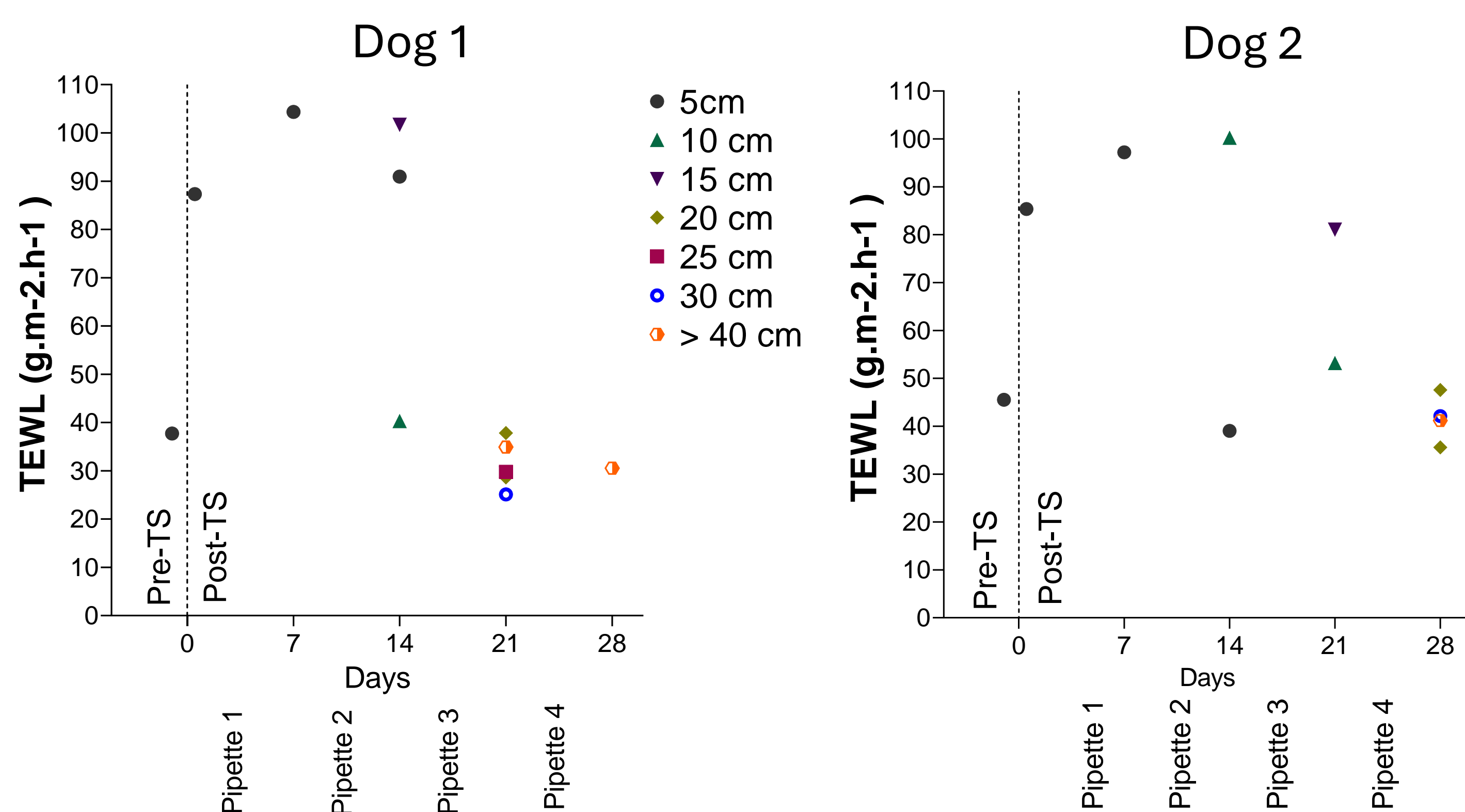
1. The pipettes diffuse evenly over the animal's skin, but require several applications before an effect is visible
2. The pipettes diffuse progressively. The effect is first visible close to the point of application and then spreads outwards in a centrifugal direction.

## 2. Materials and methods

- 2 healthy male Beagle dogs
- Successive applications of Dermoscent ATOP 7<sup>®</sup> spot-on (1 pipette/week for 4 weeks) on the middle of the back.
- TEWL and skin surface hydration (SSH) are measured, after delamination of the *stratum corneum* by tape-stripping.
- Measures are performed at 5, 10, 15, 20, 30 or 40 cm from the point of application.
- If the value of TEWL or/and SSH was back to normal (value before tape stripping) at 5cm, the measure was made at 10cm. If the value of TEWL was not changed, the measurement was stopped at this distance, a new pipette was poured on and the new measures were made one week later.



## 3. Results



- At study start, mean TEWL values before (Pre-TS) and after *stratum corneum* tape stripping (Post-TS) were respectively 37.7 and 87.3 g.m<sup>-2</sup>.h<sup>-1</sup> in dog 1 and 45.5 and 85.4 g.m<sup>-2</sup>.h<sup>-1</sup> in dog 2.
- For dog 1, TEWL after tape stripping was back to baseline at 10cm (TEWL=40.3g.m<sup>-2</sup>.h<sup>-1</sup>) after 2 weeks and at 20, 25, 30 and 40cm (TEWL=34.9g.m<sup>-2</sup>.h<sup>-1</sup>) 3 weeks.
- For dog 2, TEWL after tape stripping was back to baseline at 5cm after 2 weeks (TEWL=39g.m<sup>-2</sup>.h<sup>-1</sup>), at 10cm after 3 weeks (TEWL=53g.m<sup>-2</sup>.h<sup>-1</sup>) and at 15, 20, 25, 30 and 40cm after 4 weeks (TEWL=35.5g.m<sup>-2</sup>.h<sup>-1</sup>)

### Reference

Idee, A.; Mosca, M.; Pin, D. Skin Barrier Reinforcement Effect Assessment of a Spot-on Based on Natural Ingredients in a Dog Model of Tape Stripping. *Vet. Sci.* **2022**, *9*, 390. <https://doi.org/10.3390/vetsci9080390>

## 4. Discussion

- In this model we supposed that if the TEWL value measured at one point is not back to normal (TEWL value before tape stripping), the pipette had not diffused to this point.
- The results seem to support hypothesis 1 because after 3 pipettes for dog 1 and 4 pipettes for dog 2, all TEWL values, regardless of distance, are back to normal
- The value of SSH is independent of ATOP 7<sup>®</sup> spot on (results not shown)

## 5. Conclusion and perspectives

ATOP 7<sup>®</sup> spot-on diffuses from the application point in all directions and limits TEWL after barrier alteration. Three to four pipettes are needed to observe an effect at 40cm. This study is not sufficient to confirm the diffusion model of ATOP 7<sup>®</sup> spot-on. A new study with more dogs will be designed to validate a hypothesis of diffusion.

**Conflict of interest** : M. CAUQUIL is a Research and Development manager in LDCA/Nextmune.

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