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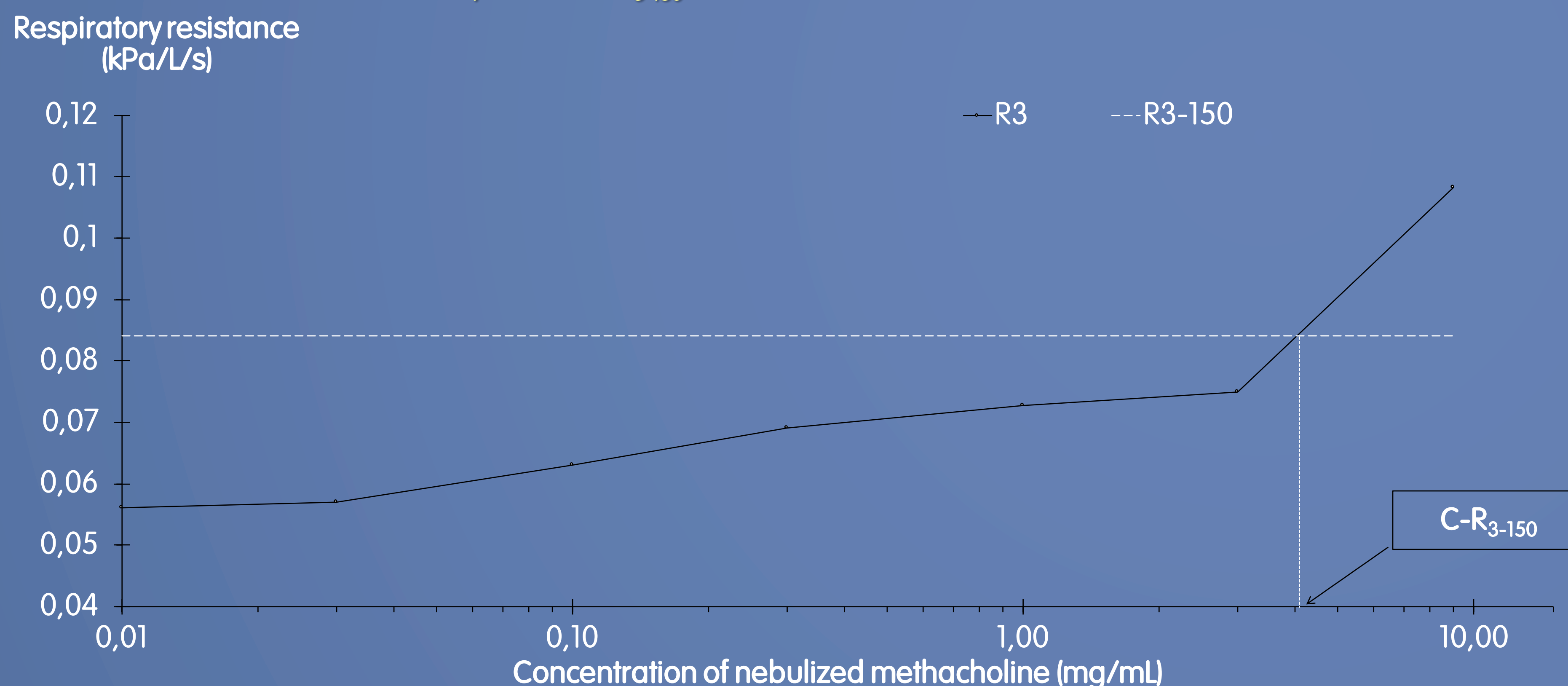
INTRODUCTION

- Clinical examination and ancillary tests used in clinical routine are not sufficiently sensitive to diagnose horses in clinical remission of severe equine asthma (SEA).
- Methacholine bronchoprovocation test (MBT) is used for diagnosis of asymptomatic human asthma (Crapo *et al.*, 2000). It has been used in some research protocols in horses but no study has examined its potential value for clinical diagnostic.
- **AIM OF THE STUDY:** To assess whether the methacholine bronchoprovocation test is an applicable and repeatable clinical test to distinguish control horses and SEA horses in clinical remission.

MATERIAL & METHODS

- Six horses with history of SEA (4 mares and 2 geldings, aged 18.8 ± 3.9 years) in clinical remission and 6 controls (4 mares and 2 geldings, aged 8 ± 4.5 years).
- MBT realized with **methacholine nebulization at increasing concentrations** (Figures 1).
- The following ancillary tests were realized:
 - Pulmonary function test with **impulse oscillometry system** (Figures 2).
 - Tracheal mucus and tracheal septum thickness scores
 - BALF cytology
- Repeatability and effect of 1 week in barn environmental conditions were tested.

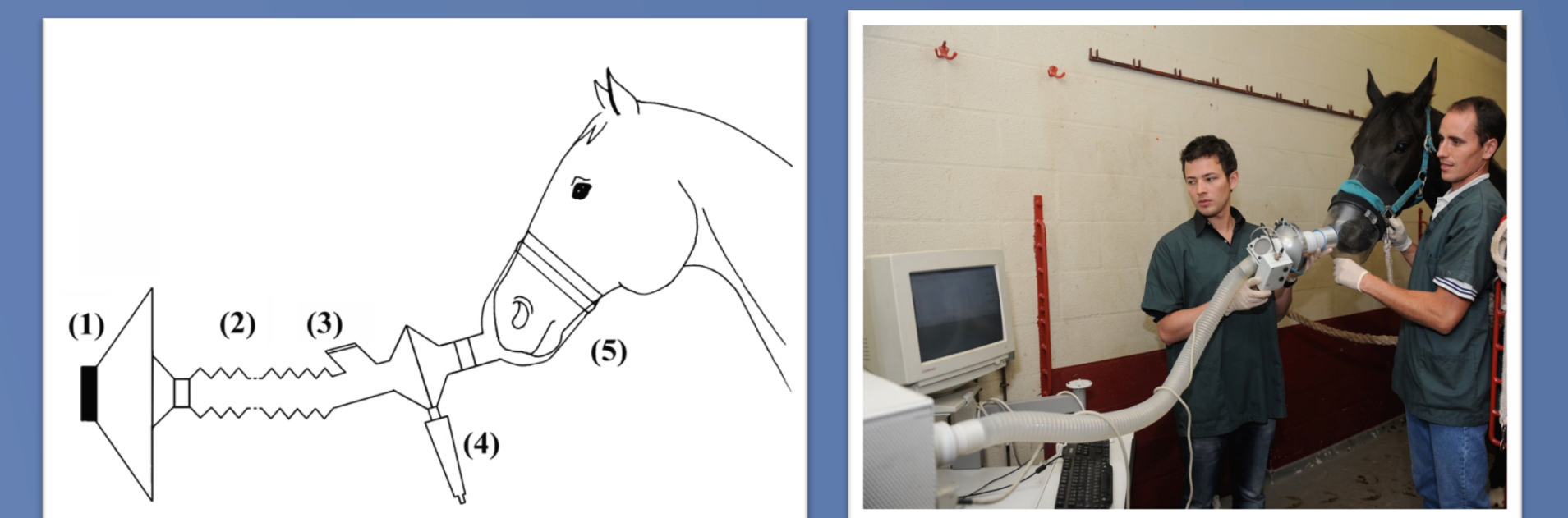
Realization of the methacholine bronchoprovocation test. Based on the initial respiratory resistance at 3Hz, a threshold is calculated, being 150% of the base value (R3-150). Then, increasing concentration of methacholine are nebulized, followed by a pulmonary function test to assess the respiratory resistance at 3Hz (R3). When R3 reaches R3-150, the concentration of nebulized methacholine can be extrapolated (C-R₃₋₁₅₀).



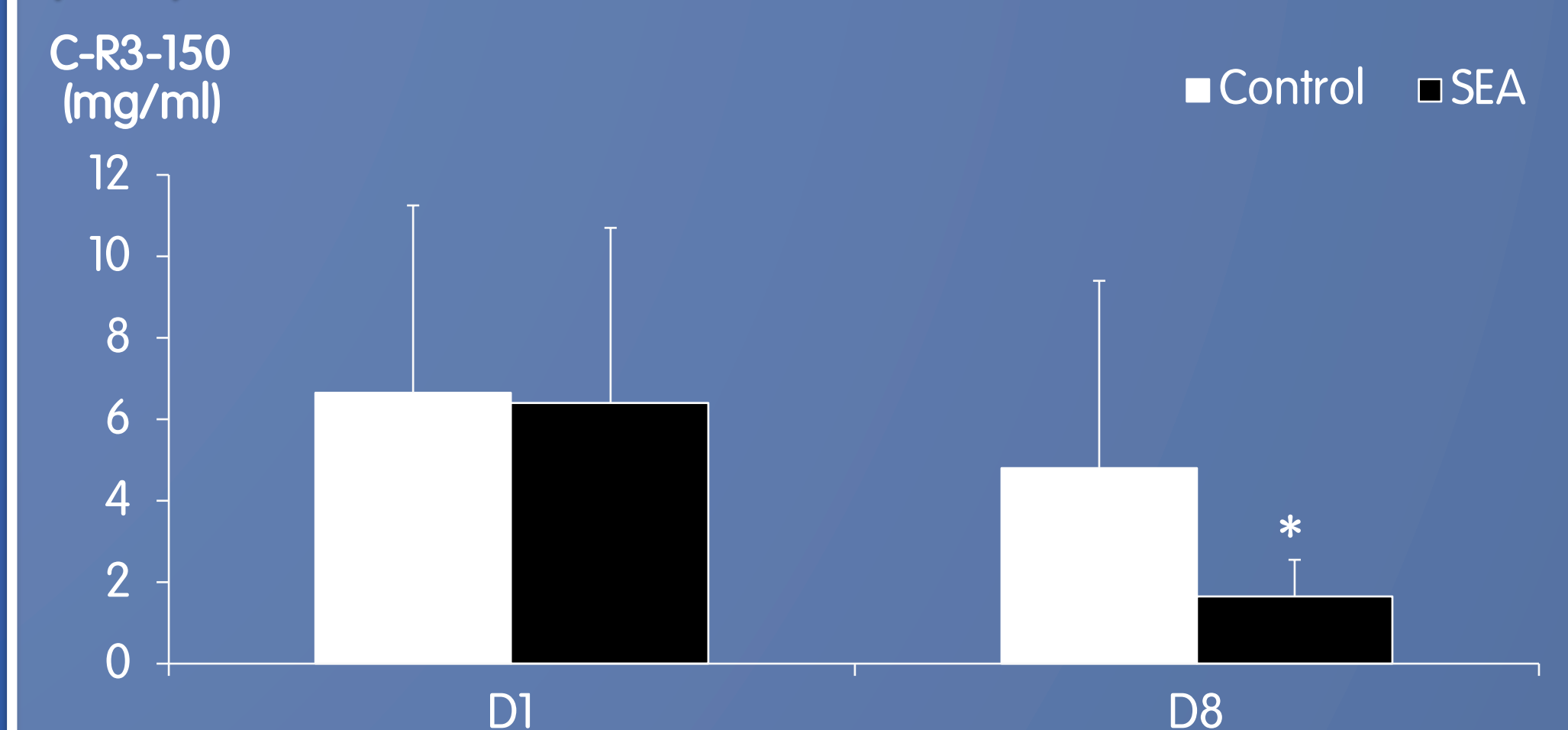
Figures 1. MBT realized with nebulisation of increasing concentrations of methacholine.



Figures 2. Pulmonary function test in the horse realized with impulse oscillometry system (van Erck *et al.*, 2004).



Concentration of nebulized methacholine needed to increase the respiratory resistance at 150% of its base value (C-R₃₋₁₅₀) before (D1) and after (D8) 1 week environmental challenge in normal quality stable.



RESULTS

- **Good feasibility and significant repeatability.**
- Before the stay in stalls, SEA and controls horses could not be differentiated by the MBT.
- After a 7-days period of straw and hay exposure, the bronchial hyperresponsiveness was increased in both SEA and control horses, while the other clinical or functional parameters were not significantly affected.
- The 7-days period in stalls resulted in a significant difference in bronchoreactivity between SEA and control horses.

CONCLUSION

- Methacholine BPT does not permit to differentiate control and asymptomatic SEA horses in clinical remission, unless the horses have been kept in stalls.
- These results suggest that the mechanisms underlying the bronchial hyperresponsiveness in asthma differ between human and equine patients.
- **PERSPECTIVES:**
 - the BPT may be used to detect asymptomatic severe asthmatic horses after a light environmental challenge;
 - Further researches are needed to assess the clinical interest of BPT for subclinical mild-moderate equine asthma patients.

REFERENCES

- CRAPO RO, CASABURI R, COATES AL, ENRIGHT PL, HANKINSON JL, IRVIN CG, MACINTYRE NR, MCKAY RT, WANGER JS, ANDERSON SD, COCKCROFT DW, FISH JE AND STERK PJ (2000) Guidelines for methacholine and exercise challenge testing. *J Respir Crit Care Med* 161:309-329.
- VAN ERCK E, VOTON D, ART T AND LEKEUX P (2004) Measurement of respiratory function by impulse oscillometry in horses. *Equine Vet J* 36:21-28.