

Switching Off: Autonomic Modulation with a Fast-Acting Nootropic Alters Arousal and Cognitive Engagement in Working Dogs

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INTRODUCTION & AIM

- High-drive working dogs often struggle to disengage or down-regulate arousal between tasks, creating operational challenges and welfare concerns.^{1,2}
- Fast-acting, non-sedative autonomic-modulating nootropics, formulations designed to transiently reduce arousal and promote behavioral calming, may offer a viable alternative to traditional sedatives or anxiolytics.
- Thus, the purpose of this study was to examine the acute behavioral, cognitive, and task-engagement effects of a fast-acting autonomic-modulating nootropic in working dogs.

METHOD

- **Subjects:** n = 10 high-drive working dogs
- **Study Design:** Two test sessions per dog:
 - CTRL: Baseline condition
 - CALM®: Fast-acting autonomic-modulating nootropic condition
- **Behavioral & Cognitive Tasks:**
 - A. Sustained-attention focus-hold trials at 30 s, 60 s, and 90 s durations using preferred and non-preferred stimuli.
 - B. Puzzle-solving tasks at difficulty Levels 1 and 2.
 - C. Behavioral intensity ratings (1–5 scale)
- **Data Processing:**
 - Duration-based outcomes converted to percentage of maximal possible time
 - Within-dog comparisons: CTRL vs CALM®
 - Paired t-tests with Cohen's dz effect sizes
 - Cap-hit frequencies summarized descriptively

REFERENCES

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2. Hart LA, Zasloff RL, Bryson S, Christensen SL. The role of police dogs as companions and working partners. *Psychol Rep*. 2000 Feb;86(1):190-202. PMID: 10778270.
3. Marshall-Pescini S, Passalacqua C, Barnard S, Valsecchi P, Prato-Previde E. Agility and search and rescue training differently affects pet dogs' behaviour in socio-cognitive tasks. *Behav Processes*. 2009 Jul;81(3):416-22. PMID: 19520242.

RESULTS & DISCUSSION

Sustained Attention:

- Reduced attention under CALM® across all non-preferred durations ($p = 0.023-0.038$; $dz = -0.77$ to -0.87)
- 90 s preferred stimulus also reduced ($p = 0.004$; $dz = -1.22$)
- Similar directional trends at 30–60 s preferred intervals ($p \geq 0.070$; $dz = -0.63$ to -0.65)

Puzzle-Solving Performance:

- Small-moderate slowing during puzzle tasks ($dz = -0.36$ to -0.51)
- Higher failure rate on Level 2 puzzles under CALM®
 - CTRL: 1 unsolved; CALM®: 4 unsolved

Behavioral Intensity:

- Behavioral intensity decreased across tasks ($dz = -0.24$ to -0.80)

- When encountering an impasse during CALM® testing, dogs frequently disengaged or sought handler cues.
- This resembles “looking-back” behavior in social referencing paradigms, interpreted as joint attention and human-directed information seeking.³
- These data suggest CALM® reduced behavioral arousal and may shift behavior toward greater handler-guided responses, alongside reduced sustained attention and task persistence.

CONCLUSION

- CALM® produced a coherent down-regulation of arousal and behavioral engagement intensity without apparent cognitive impairment, providing a consistent response with the formulation's autonomic-modulating design.
- These findings suggest transient autonomic down-regulation may reduce stress-associated behavioral escalation in high-drive working dogs, potentially improving animal welfare, handler safety, and treatment compliance during field medical care.^{1,2,3}



Working Dogs



Focus-Hold Task @ 30, 60, and 90s



Puzzle Level 1 + Level 2

Baseline [CTRL] vs. Treatment Condition [CALM®]