

DOG BEHAVIOR

VOLUME 9 · ISSUE 1 · 2023

Special issue

Proceedings of the 5th European Veterinary College
of Behavioural Medicine and Animal Welfare

(Pisa, 19th-20th October 2023)

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The abstracts presented in this volume have undergone a double-blind peer review process.

The scientific direction of the journal together with the conference organizing committee wants to thank the anonymous referees who contributed to the transparency and scientific quality of the presented papers.

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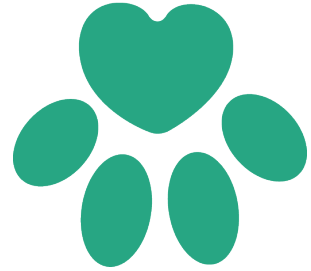
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Welcome

The local committee is pleased to welcome the participants of the 5th EVCBMAW which will take place on 19th-20th October 2023 in Pisa, a small Italian city on a human and animal scale, rich in history, culture and science. In fact, the birth of the University of Pisa, which you will find widespread and integrated in the city, in whose streets tourists mingle with students, dates back to 1343.

Pisa is the city of the Leaning Tower, a renowned symbol of Italy, a singular example of a mistake turned into a masterpiece in the magnificent casket of Piazza dei Miracoli. Pisa is also the city of Galileo Galilei, considered the father of modern science, who introduced the scientific method. We hope the atmosphere of the town will make the experience even more enjoyable.

The two days of the 5th EVCBMAW will be full of food for thought on the main theme chosen for this year: the human-animal bond. As well as an opportunity for growth, it will also be an opportunity to meet old acquaintances and new colleagues who, like us and you, are interested in the all-round welfare of non-human animals.

As always, there will be a college study day (BM & AWSEL, 18th October) and this year, after the congress (21st October), we invite you to participate in a satellite meeting with a somewhat unusual approach.

We hope to welcome all of you in Pisa and we thank since now all those who will work and are already working to make this congress a success (local, international and scientific committee), as well as those who will contribute with their abstracts and participation.

Chiara Mariti & Angelo Gazzano
On behalf of the Local Committee

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Changes in ground reaction forces during a startle response in a dog-implications for underlying painful conditions

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Abstract: Medical conditions affect a wide range of behaviour problems. Among these, acute and chronic pain can play a major role¹. One of the suggested mechanisms is that pain causes a fear related avoidance behaviour due to classical conditioning. This includes startle responses causing muscle tensing, potentially exacerbating any underlying musculoskeletal pain³. In this case report we report changes in ground reaction forces by a kinetic analysis⁴, during a startle response in a dog that was standing on a declined force plate (Zebris®, Germany). A short noise caused a 0.53 second startle reaction (time period to re-establish normal weight bearing distribution), in which both hind limbs lost ground contact for 0.24 seconds (a non-visible jump to the human eye). Maximum vertical forces increased by 83% in the left hind limb (max. 55 Newton), 64% in the right front limb (max. 156 Newton), 50% in the left front limb (max. 135 Newton) and 34% in the right hind limb (max. 58 Newton). Within a fraction of a second maximum overall weight bearing on all four limbs increased from 26.3 kg to 41.2 kg. Displacement of the center of pressure (COP) within each paw varied from 5.92-16.78 mm in craniocaudal direction and 1.71-9.22 mm in medio-lateral direction. This is the first report of extensive changes in weight bearing and displacement of COP in each paw in a dog while experiencing a startle reaction. Based on our findings, it seems highly probable that even a short startle reaction can exacerbate already existing underlying pain in dogs.

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References

1. Mills DS, Demontigny-Bédard I, Gruen M, Klinck MP, McPeake KJ, Barcelos AM, Hewison L, Van Haevermaet H, Denenberg S, Hauser H, Koch C, Ballantyne K, Wilson C, Mathkari CV, Pounder J, Garcia E, Darder P, Fatjó J, Levine E. Pain and Problem Behavior in Cats and Dogs. *Animals (Basel)*. 2020 Feb 18;10(2):318. doi: 10.3390/ani10020318 Titel anhand dieser DOI in Citavi- Projekt übernehmen. PMID: 32085528 Titel anhand dieser Pubmed-ID in Citavi- Projekt übernehmen; PMCID: PMC7071134. Titel anhand dieser PMC-ID in Citavi-Projekt übernehmen.
2. Vlaeyen JWS, Linton SJ. Fear-avoidance and its consequences in chronic musculoskeletal pain: a state of the art. *Pain*. 2000 Apr;85(3):317-332. doi: 10.1016/S0304-3959(99)00242-0. PMID: 10781906.
3. Lopes Fagundes AL, Hewison L, McPeake KJ, Zulch H, Mills DS. Noise Sensitivities in Dogs: An Exploration of Signs in Dogs with and without Musculoskeletal Pain Using Qualitative Content Analysis. *Front Vet Sci*. 2018 Feb 13; 5: 17. doi: 10.3389/fvets.2018.00017.
4. Millis, Darryl, and David Levine. *Canine rehabilitation and physical therapy*. Elsevier Health Sciences, 2013.

A study of the emotional impact of euthanasia on practising French veterinarians

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Abstract: Euthanasia is known to induce ethical dilemmas, moral conflicts, and potential moral distress in veterinarians. This study was aimed at evaluating the emotional impact of euthanasia on French practising veterinarians. 10 in-depth interviews were carried out by the same researcher (MA) on a varied panel of veterinarians who were not specialists, recorded and verbatim transcribed. Non-verbal language was reported. Saturation was reached. Thematic analysis was conducted by the two authors. Results showed that euthanasia may have serious emotional consequences on veterinarians. It induces many negative emotions (sadness, anger, frustration, etc). Their impact depends on factors related to the owner (personality, human-animal bond, length of relationship with vet), the animal (medical record, history, length of follow-up by vet, nature of euthanasia procedure) and to the vet (work experience, gender, empathy with client). These results confirm the potential impact of euthanasia on veterinarians' well-being and advocate for more research in order to suggest and implement efficient methods to help veterinarians deal with their emotions.

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Performance and behavioral changes of turkeys in enrichment environments and different stocking densities

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Abstract: Turkeys are commonly raised in high stocking density with barren environments. Poult sexing is a common practice at the hatchery yet uncommon in developing countries, and there is minimal information on the welfare of mixed-sex turkey production. This study aimed to compare the effect of different stocking densities (SD) (Low SD: 7.92 kg/m² vs. High SD: 13.32 kg/m²; n=22 vs. n=37, respectively) and environmental enrichment (EE) using perches, bales, chains, and toy balls in 9m² pens with 3 replicates. 354 turkeys mixed-sexed Nicholas700 were randomly allocated into four treatments (A: Low SD with EE, B: Low SD without EE, C: High SD with EE, D: High SD without EE) from 4 to 14 weeks of age (woa) in Central Mexico. Repeated measures ANOVA and CATMOD procedures (SAS 9.2) were done for performance, and behavioral analysis to assess the frequency of each behavior by a contingency table (respectively). No significant differences between treatments within the same woa (p=0.98) body weight gain were observed. Feed intake was significantly increased across time in all treatments (p<0.0001). The most common behaviors were standing, resting, and walking across time regardless of the EE or SD effect. The turkeys allocated approximately 7.3% of their time using EE if available. At 6 and 10 woa the turkeys had a higher interaction percentage with the EE (8.68% and 9.11%, respectively), while at 8 woa they performed a lower interaction (4.9%). There were no differences observed performance-wise. The birds did not invest much time in EE usage but likely improved their welfare compared to groups without EE.

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References

1. NFACC, "Code of practice for the care and handling of hatching eggs, breeders, chickens, and turkeys," Ottawa, Canada, 2016.

Owner attitudes towards cat collars and their use in central Europe

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Abstract: The use of cat collars is seen as controversial due to the potential, albeit low risk of severe injury or death [1]. We conducted an online-survey on cat management and owner attitude towards collar use in German-speaking cat owners. 33% of the participants (N = 5124) reported to have used a collar on at least one of their cats. Within the last two years, 32% of collar users had used regular collars and 11% used antiparasitic collars. Owners of free-roaming cats reported collar use more often than indoor cat owners (39% vs. 22%; $\chi^2=157.59$, $p<0.001$). The most common reasons for using collars were identification (49%), increasing visibility (42%), and parasite control (38%). Especially owners of free-roaming cats assigned higher importance to increased visibility (e.g. reflective collars). Other reasons for collar usage were tracking (22%), reduction of predation (21%), or control of an electronic cat door (13%). Owners who never used collars on their cats were most concerned about collars being dangerous (77%) or the increase in risk of injury (73%). 55% of cat owners feared negative effects on cat welfare, 35% stated a collar to not be necessary (e.g. indoor housing), and 22% had heard reports of bad experiences with collars. Although visible identification could increase return of cats to their homes, collar use is still low, and the perceived risks of collars seems to be the main reason. Research on modern functional collars might help alleviate the owners' concerns.

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References

1. Arhant, C., Lesch, R., Heizmann, V., Schauburger, G., & Windschnurer, I. Risks associated with free-roaming and collar use in cats—An online survey. *Journal of Veterinary Behavior* 2022, 58, 23-36.

Vulnerability, veterinary ethics and social 'care' in the veterinary clinic

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Abstract: It has been suggested that whilst vulnerability appears to be at the heart of all bioethical inquiry, the generalised use of the term does not help us to understand and rationalise the needs of different individuals [1]. In this paper I consider whether this argument may also be applied to traditional veterinary ethical approaches, and share empirical data which supports a broader conceptualisation of ethical vulnerability in the veterinary clinic. Whilst feminist approaches to veterinary ethics [2] are currently underdeveloped within the field [3], vulnerability is considered a key concept within feminist ethics literature more broadly [4]. Through a feminist care analysis, I show how the concept of vulnerability may be applied beyond the animal patient in such settings. In this presentation I share a secondary thematic analysis of 9 facilitated ethical group discussions and 15 individual interviews with charity veterinary hospital teams. I identify context specific sources of vulnerability in the charity veterinary clinic, highlighting how financial, medical and social vulnerabilities may bring animal owners into the sphere of veterinary ethical concern. Finally, I demonstrate how vulnerabilities may be shared across species and ask what obligations the veterinary profession have towards vulnerable animal owners. In conclusion, I show how a more nuanced focus on vulnerability may challenge accepted ethical priorities in the veterinary clinic. These findings have implications for the provision of social care in the veterinary clinic [5] and support the further development of feminist approaches to veterinary ethics [2].

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References

1. Rogers, W. Mackenzie, c. Dodds, S. Why bioethics needs a concept of vulnerability. *IJFAB: International Journal of Feminist Approaches to Bioethics* 2012 5:2, 11-38.
2. Ashall, V. 2022 A Feminist Ethic of Care for the Veterinary Profession. *Front. Vet. Sci.* 2022 9:795628. doi: 10.3389/fvets.2022.795628.
3. Mullan S, Fawcett A. *Veterinary Ethics: Navigating Tough Cases*. Sheffield: 5M Publishing 2017. 4. Puig de la Bel-lacasa M. *Matters of Care: Speculative Ethics in More Than Human Worlds*. Minneapolis, MN: University of Minnesota Press 2017. 5. Laing, M., & Maylea, C. "They Burn Brightly, But Only for a Short Time": The Role of Social Workers in Companion Animal Grief and Loss. *Anthrozoös*, 2018 31(2), 221–232. <https://doi.org/10.1080/08927936.2018.1434062>

Induced and spontaneous changes of the vomeronasal organ and their impact on life and behaviour of animals.

A review

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Abstract: Chemical communication is ensured by the exchange of chemical cues in mammals, and the vomeronasal organ (VNO) is the structure responsible for their detection. The aim of this review is to present the main studies that identified the behavioural and physiological changes induced by experimental or spontaneous lesions of the VNO, thus contributing to the understanding of VNO's role in animals. The VNO removal has been associated with various behavioural and physiological changes caused by an altered neural and neuroendocrine response [1,2] in mice, guinea pigs, and prairie voles, and with a significant decrease in alarm perception in rats [3]. The VNO blockage induced by duct cauterization impaired the neonatal offspring recognition in ewes [4] and the Whitten effect in does [5]. More recently, also VNO spontaneous alterations have been reported and associated with some behavioural troubles. We described the VNO chronic inflammation and its association with intraspecific aggression in cats [6] and farm pigs [7], as a result of the vomeronasal neuron loss [8]. In mice, the VNO degeneration caused by the aging process [9] significantly impacts alarm cues perception and fleeing behaviour. Finally, a recent case report associated the congenital agenesis of the VNO with fear-related aggression towards unknown people and environmental phobia in a dog [10]. Taken together, these studies deeply explored and confirmed the crucial role that the VNO plays in several aspects of animal behaviour and life, providing a wide overview of its importance in laboratory, companion, and farm animals.

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References

1. Wysocky, C.; Lepri, J. Consequences of removing the vomeronasal organ. *J. Steroid Biochem. Mol. Biol.* 1991, 39, 661–669.
2. Pankevich, D.; Cherry, J.; Baum, M. Effect of vomeronasal organ removal from male mice on their preference for and neural Fos responses to female urinary odors. *Behav. Neurosci.* 2006, 120, 925–936.
3. Kiyokawa, Y.; Kikusui, T.; Takeuchi, Y.; Mori, Y. Removal of the vomeronasal organ blocks the stress-induced hyperthermia response to alarm pheromone in male rats. *Chem. Senses* 2007, 32, 57–64.
4. Booth, K.K.; Katz, L.S. Role of the vomeronasal organ in neonatal offspring recognition in sheep. *Biol. Reprod.* 2000, 63, 953–958.
5. Booth, K.K.; Webb, E.C. Effect of blockage of the ducts of the vomeronasal organ on LH plasma levels during the “Whitten Effect” in does. *Vet. Med. Int.* 2010, 2011, 305468.
6. Asproni, P.; Cozzi, A.; Verin, R.; Lafont-Lecuelle, C.; Bienboire-Frosini, C.; Poli, A.; Pageat, P. Pathology and behaviour in feline medicine: Investigating the link between vomeronasalitis and aggression. *J. Feline Med. Surg.* 2016, 18, 997–1002.
7. Asproni, P.; Mainau, E.; Cozzi, A.; Carreras, R.; Bienboire-Frosini, C.; Teruel, E.; Pageat, P. Is There a Link between Vomeronasalitis and Aggression in Stable Social Groups of Female Pigs? *Animals* 2022, 12, 303.
8. Mechin, V.; Asproni, P.; Bienboire-Frosini, C.; Cozzi, A.; Chabaud, C.; Arroub, S.; Mainau, E.; Nagnan-Le Meillour, P.; Pageat, P. Inflammation interferes with chemoreception in pigs by altering the neuronal layout of the vomeronasal sensory epithelium. *Front. Vet. Sci.* 2022, 9, 936838.
9. Mechin, V.; Pageat, P.; Teruel, E.; Asproni, P. Histological and Immunohistochemical Characterization of Vomeronasal Organ Aging in Mice. *Animals* 2021, 11, 1211.
10. Muñoz-de Miguel, S.; Barreiro-Vázquez, J.D.; Sánchez-Quinteiro, P.; Ortiz-Leal, I.; González- Martínez, Á.G. Behavioural disorder in a dog with congenital agenesis of the vomeronasal organ and the septum pellucidum. *Vet. Rec. Case Rep.* 2023; e571.

Can dog caregivers' assessments be included in veterinary clinical pain assessment?

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Abstract: Chronic pain assessment is a challenging area in veterinary medicine. Our recent study showed that dog caregivers were able to read some pain-related changes in behavior and body language of their dogs [1]. This abstract will discuss the chronic pain assessment tools in veterinary medicine in light of new findings. Chronic pain is a sort of pain that lasts longer than expected and may cause negative affective states including anxiety and depression [2, 3]. Since pain is a subjective sensory-emotional experience, assessing pain in clinical settings is challenging. Several different multifactorial clinical instruments are used to assess chronic pain and quality of life in dogs [4-9]. Those tools mainly focus on movement evaluation [10] such as postural and gait changes, and reluctance or refusal to perform activities [3, 11]. Since animals tend to mask their pain in challenging situations [12] and subtle behavioral changes may be overlooked in the clinical environment [13], assessments on daily behavior have critical importance to notice early signs of chronic pain. Development of chronic pain scales which can easily be used by caregivers and reliably interpreted by veterinarians is essential to assess and manage the pain process [12, 14]. Our recent study showed that movement-based behaviors and ear-tail positions of dogs can be recognised by dog caregivers in daily contexts [1]. We suggest that chronic pain assessment tools should include daily behavioral changes which can be interpreted by caregivers. Using body language diagrams indicating negative emotional states in pet animals would also be helpful to include emotional assessment in the veterinary pain assessment tools.

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References

- Demirtas, A., Atilgan, D., Saral, B., Isparta, S., Ozturk, H., Ozvardar, T., & Demirbas, Y. S. (2023). Dog owners' recognition of pain-related behavioral changes in their dogs. *Journal of Veterinary Behavior*.
- Ashburn, M. A., & Staats, P. S. (1999). Management of chronic pain. *The Lancet*, 353(9167), 1865-1869.
- Belshaw, Z., & Yeates, J. (2018). Assessment of quality of life and chronic pain in dogs. *The Veterinary Journal*, 239, 59-64.
- Hielm-Björkman, A. K., Rita, H., & Tulamo, R. M. (2009). Psychometric testing of the Helsinki chronic pain index by completion of a questionnaire in Finnish by owners of dogs with chronic signs of pain caused by osteoarthritis. *American journal of veterinary research*, 70(6), 727-734.
- Brown, D. C., & Raymond, C. (2008). Boston RC, James C, Coyne JC, Farrar JT. Ability of the canine brief pain inventory to detect response to treatment in dogs with osteoarthritis. *J Am Vet Med Assoc*, 233, 1278-83.
- Valentin, S. (2009). Cincinnati orthopaedic disability index in canines. *Aust J Physiother*, 55(4), 288.
- Norkus, C. L. (2014). Chronic pain management for the companion animal. *Pain Management for Veterinary Technicians and Nurses*, 125-146.
- Walton, M. B., Cowderoy, E., Lascelles, D., & Innes, J. F. (2013). Evaluation of construct and criterion validity for the 'Liverpool Osteoarthritis in Dogs'(LOAD) clinical metrology instrument and comparison to two other instruments. *PLoS One*, 8(3), e58125.
- Epstein, M. E., Rodan, I., Griffenhagen, G., Kadrlík, J., Petty, M. C., Robertson, S. A., & Simpson, W. (2015). 2015 AAHA/AAFP pain management guidelines for dogs and cats. *Journal of Feline Medicine and Surgery*, 17(3), 251-272.
- Brown, D. C. (2014). The canine orthopedic index. Step 3: responsiveness testing. *Veterinary Surgery*, 43(3), 247-254.
- Hielm-Björkman, A. (2013). Recognition and assessment of chronic pain in dogs. *Pain Management in Veterinary Practice*, 227-237.
- Sharkey, M. (2013). The challenges of assessing osteoarthritis and postoperative pain in dogs. *The AAPS journal*, 15, 598-607.
- Mich, P. M., & Hellyer, P. (2008). Objective, categoric methods for assessing pain and analgesia. *Gaynor JS, Muir III WW. Veterinary pain management*. 2nd edition. Mosby Elsevier, St. Louis, 78-109.
- Reid, J., Nolan, A. M., & Scott, E. M. (2018). Measuring pain in dogs and cats using structured behavioural observation. *The Veterinary Journal*, 236, 72-79.

Evaluation of animal welfare and ethics teaching to UK zookeepers

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Abstract: Introduction A previous large-scale survey of international zoo staff identified a range of self-identified educational needs, particularly relating to a better understanding of welfare science and behaviours in zoo animals [1]. Themes important to effective zookeeper education, include self-efficacy, self-motivation and stockpersonship, and a contextual understanding of the relationship between wild animal behaviour and zoo animal behaviour and welfare [2]. This presentation uses these findings as a basis for developing an educational intervention for zookeepers in the UK. Methods Results of a large scale survey identifying topics for future training were used to formulate intended learning outcomes (ILOs). Educational content was developed to achieve these ILOs and delivered to UK zookeepers. The impact of the intervention was evaluated using a questionnaire and focus group with questions based on Kirkpatrick's evaluation framework [3]. Results The 2020 surveys generated return rates of pre = 48.57%, post = 11.43% (cohort n = 35). The 2021 survey return rate were: pre = 66.67%, post = 21.05% (cohort n = 57). Students showed knowledge increase from pre- to post-teaching (Fishers exact $p < 0.05$), and found the teaching useful and engaging. Students reported reflecting on their own views on ethical issues and implementing changes to animal husbandry based on the teaching. Conclusions Targeted education delivered in a way that challenges prior beliefs and encourages self-reflection can improve zookeeper knowledge and potentially change beliefs and behaviours towards zoo animals. This study was approved by the University of Edinburgh's Human Ethical Review Committee (number 579_20).

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References

1. Bacon, H.; Bell, C.; Dwyer, C.M.; Waran, N.; Qing, Y.; Xia, L.; Shaw, D.J. Exploration of cultural norms and behavioural beliefs about zoo animal behaviour, welfare, ethics and husbandry practices in a sample of the international zoo community. *Zoo Biology* 2023.
2. Bacon, H.; Vigors, B.; Shaw, D.J.; Waran, N.; Dwyer, C.M.; Bell, C. Zookeepers—the most important animal in the zoo? *Journal of Applied Animal Welfare Science* 2021, 11, 1-13.
3. Kirkpatrick, D.; Kirkpatrick, J. *Evaluating training programs: The four levels*; Berrett-Koehler Publishers: 2006.

Presumed idiopathic epilepsy as a consideration for aggressive behaviours in an adult rottweiler dog

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Abstract: Introduction A 3-year-7-month-old male neutered rottweiler presented with a 14-month history of progressive behavioural changes, including aggression and reactivity towards familiar and unfamiliar people and dogs. These clinical signs had an acute onset, and the patient was reported normal beforehand. One year later, progression with episodic fly biting, lip smacking, paroxysmal growling, and vacant episodes were noticed. A complete neurological examination was impossible to perform. Treatment with levetiracetam was trialled for suspected partial seizures. The frequency of fly biting, lip smacking and growling reduced in response to treatment, but aggression persisted. Comprehensive blood analysis, including thyroid panel and serology (Neospora, Toxoplasma, Borrelia), urine analysis (including urine organic acids [1]), magnetic resonance imaging of the brain and cerebrospinal fluid analysis were largely unremarkable. Diagnosis & case management Investigations did not identify any structural or metabolic cause affecting the central nervous system. Idiopathic epilepsy or occult neurodegenerative disease were the most likely differential diagnoses. Treatment with phenobarbital was initiated alongside levetiracetam. Within a few weeks of treatment, patient behaviour improved significantly. Follow-up five months later showed good seizure control and almost complete resolution of the behavioural signs. Conclusion Observed aggressive behaviours could be attributed to postictal states related to undetected focal seizure activity or less likely ictal fear-related aggressivity rarely described in dogs [2, 3] and human patients [4, 5]. Cognitive and neurobehavioural comorbidities [6, 7, 8, 9] in patients with idiopathic epilepsy are well documented. Therefore, neurological conditions, especially epilepsy, should be considered a differential diagnosis of behavioural changes.

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References

1. Shea, A.; De Risio, L.; Carruthers, H.; Ekiri, A.; Beltran, E. Clinical Features and Disease Progression of L-2-Hydroxyglutaric Aciduria in 27 Staffordshire Bull Terriers. *Veterinary Record* 2016, 179 (21), 545–545.
2. Stassen, Q. E.; Grinwis, G. C.; van Rhijn, N. C.; Beukers, M.; Verhoeven, N. M.; Leegwater, P. A. Focal Epilepsy with Fear-Related Behavior as Primary Presentation in Boerboel Dogs. *Journal of Veterinary Internal Medicine* 2018, 33 (2), 694–700.
3. Dodman, N. H.; Knowles, K. E.; Shuster, L.; Moon-Fanelli, A. A.; Tidwell, A. S.; Keen, C. L. Behavioral Changes Associated with Suspected Complex Partial Seizures in Bull Terriers. *Journal of the American Veterinary Medical Association* 1996, 208(5), 688–691.
4. Marsh, L.; Krauss, G. L. Aggression and Violence in Patients with Epilepsy. *Epilepsy & Behavior* 2000, 1 (3), 160–168.
5. Sumer, M. M.; Atik, L.; Unal, A.; Emre, U.; Atasoy, H. T. Frontal Lobe Epilepsy Presented as Ictal Aggression. *Neurological Sciences* 2007, 28 (1), 48–51.
6. Packer, R. M.; McGreevy, P. D.; Salvin, H. E.; Valenzuela, M. J.; Chaplin, C. M.; Volk, H. A. Cognitive Dysfunction in Naturally Occurring Canine Idiopathic Epilepsy. *PLOS ONE* 2018, 13 (2).
7. Shihab, N.; Bowen, J.; Volk, H. A. Behavioral Changes in Dogs Associated with the Development of Idiopathic Epilepsy. *Epilepsy & Behavior* 2011, 21 (2), 160–167.
8. Watson, F.; Packer, R. M.; Rusbridge, C.; Volk, H. A. Behavioural Changes in Dogs with Idiopathic Epilepsy. *Veterinary Record* 2020, 186 (3), 93–93.
9. De Risio, L.; Newton, R.; Freeman, J.; Shea, A. Idiopathic Epilepsy in the Italian Spinone in the United Kingdom: Prevalence, Clinical Characteristics, and Predictors of Survival and Seizure Remission. *Journal of Veterinary Internal Medicine* 2015, 29 (3), 917–924.

Larger proportion of polled dairy calves associated with a higher good human animal relationship score in Norwegian dairy herds

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Abstract: Good human-animal relationship (HAR) is essential for good animal welfare in dairy herds [1]. Negative experiences influence HAR negatively [2, 3]. Disbudding and dehorning are potentially painful procedures which may negatively affect HAR. We aimed to investigate whether breeding a higher proportion of polled calves, thereby reducing disbudding or dehorning, was associated with higher Welfare Quality® (WQ®) criterion scores for good human-animal relationship (GHAR) in Norwegian dairy herds. A total of 5617 cows in 157 loose-housed herds were assessed using an avoidance distance test (ADT) by six certified WQ® assessors. The ADT was performed and each herd's GHAR score was calculated as described by WQ® [4]. The total numbers of calves born and registered as polled in each herd during the twelve months prior to GHAR assessment was obtained from the Norwegian Dairy Herd Recording System. Herds were categorised into tertiles based on the proportion of calves born registered as polled. A GLM was built with GHAR score as dependent variable and tertiles of the proportion of polled calves as an independent variable. Assessor was included as a fixed effect. The residuals of the model were assessed for homoscedasticity and normality. The median GHAR score was 79.2 points (IQR 70.5–86.9 points). The median proportion of polled calves was 27% (IQR 13.5–38.6%). GHAR score was significantly higher in the top tertile than the bottom tertile (Coef. = 45.2, p = 0.02). Further research is required to explore the relationship between breeding polled animals and HAR in dairy herds.

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References

- [1] A. B. des Roches, I. Veissier, X. Boivin, E. Gilot-Fromont, and L. Mounier, "A prospective exploration of farm, farmer, and animal characteristics in human-animal relationships: An epidemiological survey," *J Dairy Sci*, vol. 99, no. 7, pp. 5573-5585, Jul 2016, doi: doi.org/10.3168/jds.2015-10633.
- [2] M. Battini, E. Andreoli, S. Barbieri, and S. Mattiello, "Long-term stability of Avoidance Distance tests for on-farm assessment of dairy cow relationship to humans in alpine traditional husbandry systems," *Applied Animal Behaviour Science*, vol. 135, no. 4, pp. 267-270, 2011, doi: 10.1016/j.applanim.2011.10.013.
- [3] S. Waiblinger et al., "Assessing the human-animal relationship in farmed species: A critical review," *Applied Animal Behaviour Science*, vol. 101, no. 3-4, pp. 185-242, 2006, doi: doi.org/10.1016/j.applanim.2006.02.001.
- [4] "Welfare Quality® Assessment Protocol for Cattle." Welfare Quality® Network. (accessed 01.03.2023).

A study of small animal practitioners' emotions in France

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Abstract: International literature in the veterinary field recently focused on veterinarians' emotions and their well-being [1-6]. Studies showed alarming results. Veterinarians face moral distress and their rate of suicide is 4 times that of the general population [7]. No study was conducted in France. Therefore the authors explored French small animal practitioners' emotions at work. 15 in-depth interviews were carried out by the same researcher (CB) on a varied panel of veterinarians who were not specialists, recorded and verbatim transcribed. Non-verbal language was reported. Saturation was reached. Thematic analysis was conducted by the two authors. Results showed that veterinary practice is not neutral and induces a myriad of emotions that affect veterinarians. Negative emotions (anger, frustration, sadness, etc.) were particularly highlighted by interviewees who mentioned their impact on their well-being. Positive emotions (satisfaction, relief, happiness, fulfillment, etc.) not always counterbalanced the negative ones. Veterinarians asked for help and education in emotion management. This study will make it possible to set up accurate programmes in order to promote veterinarians' well-being.

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References

1. Calitz, A.P.; Cullen, M.D.M.; Midgley, C. Exploring the Factors That Affect the Happiness of South African Veterinarians. *J. Vet. Med. Educ.* 2022, 49, 90–101, doi:10.3138/jvme-2020-0033.
2. Kunze, A.J.; Seals, C. Exploring Valued Personality Traits in Practicing Veterinarians. *J. Vet. Med. Educ.* 2022, 49, 625–631, doi:10.3138/jvme-2021-0051.
3. Macía, P.; Goñi-Balentiaga, O.; Vegas, O.; Azkona, G. Professional Quality of Life among Spanish Veterinarians. *Vet. Rec. Open* 2022, 9, e250, doi:10.1002/vro2.50.
4. Irwin, A.; Hall, D.; Ellis, H. Ruminating on Rudeness: Exploring Veterinarians' Experiences of Client Incivility. *Vet. Rec.* 2022, 190, e1078, doi:10.1002/vetr.1078.
5. Arbe Montoya, A.I.; Hazel, S.J.; Matthew, S.M.; McArthur, M.L. Why Do Veterinarians Leave Clinical Practice? A Qualitative Study Using Thematic Analysis. *Vet. Rec.* 2021, 188, e2, doi:10.1002/vetr.2.
6. Kogan, L.R.; Rishniw, M.; Hellyer, P.W.; Schoenfeld-Tacher, R.M. Veterinarians' Experiences with near Misses and Adverse Events. *J. Am. Vet. Med. Assoc.* 2018, 252, 586–595, doi:10.2460/javma.252.5.586.
7. Brscic, M.; Contiero, B.; Schianchi, A.; Marogna, C. Challenging Suicide, Burnout, and Depression among Veterinary Practitioners and Students: Text Mining and Topics Modelling Analysis of the Scientific Literature. *BMC Vet. Res.* 2021, 17, 294, doi:10.1186/s12917-021-03000-x

In vitro effect of a nutraceutical supplement on the intestinal microbiota and SCFAs production of stressed behavior dogs

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Abstract: The bilateral communication between brain and intestine is now known, and it has been seen that stress is able to trigger gastrointestinal disorders which are in turn associated with increased levels of anxiety and depression. The present in vitro study evaluated the effects of a specific nutraceutical product containing natural anti-inflammatory compounds and pre/probiotics on the intestinal microbiota and production of short chain fatty acids in dogs with behavioral disturbances like anxiety and stress. A total of 30 dogs were enrolled in the study: 20 with signs of stress and 10 without signs of anxiety who constituted the control group. A fecal sample was taken from each dog in both groups and used as fecal inoculum for the fermentations. During each fermentative process, a small aliquot of sample was collected at three specific time points: at the beginning (T0), after 6 hours (T6) and after 24 hours of fermentation (T24) for bacterial enumeration and quantification of short-chain fatty acids. The fermentation of the tested product with the faecal inoculum of dogs with signs of anxiety modulates the gut microbiota differently compared with the faecal inoculum of healthy dogs. In fact, the tested product promotes several changes at the level of specific bacterial groups such as *Staphylococcus* spp., *Bifidobacterium* spp., *Clostridium coccoides* – *Eubacterium rectale* group, *Bacteroides-Prevotella-Porphyromonas* spp., *Lactobacillus* spp. and *Enterobacteriaceae*. As regards short-chain fatty acids analysis, the fermentation of the tested product was able to promote the production of only two fatty acids: acetic and butyric acid.

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References

- Honneffer, J.B., Minamoto, Y., Suchodolski, J.S. (2014). Microbiota alterations in acute and chronic gastrointestinal inflammation of cats and dogs. *World JGastroenterol* 20(44), 16489-97;
- Langendijk P.S., Schut F., Jansen G.J., Raangs G.C., Kamphuis G.R., Wilkinson M. & Welling G.W. (1995). Quantitative fluorescence in situ hybridization of *Bifidobacterium* spp. with genus-specific 16S rRNA-targeted probes and its application in fecal samples. *Appl Environ Microbiol* 61, 3069-75;
- Neufeld K.M., Kang N., Bienenstock J., et al. (2011). Reduced anxiety-like behavior and central neurochemical change in germ-free mice. *Neurogastroenterol Motil* 23, 255-264;
- Rinttilä T., Kassinen A., Malinen E., Krogus L. & Palva A. (2004). Development of an extensive set of 16S rDNA- targeted primers for quantification of pathogenic and indigenous bacteria in faecal samples by real-time PCR. *J Appl Microbiol* 97, 1166-77;
- Suchodolsky J.S. (2011). Intestinal Microbiota of Dogs and Cats: a Bigger World than We Thought. *Vet Clin Small Anim* 41, 261-272;
- Zhu H., Qu F. & Zhu L.H. (1993). Isolation of genomic DNAs from plants, fungi and bacteria using benzyl chloride. *Nucleic Acids Res* 21, 5279-8.

Considering the Welfare of Assistance Animals

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Abstract: In the past, dogs were the most common civilian working animals, e.g. for herding, guarding and hunting. In recent years, there has been an increasing demand for assistance animals, with a marked shift towards service, emotional support and therapy animals of varying species. In order for working animals to carry out their duty according to human requirements, they are often restricted in performing many natural, highly motivated behaviours, physically confined and even mutilated. These methods can be detrimental to the animals' welfare. For example, cats used as emotional support animals are required to accompany their owner in public regardless of this specie's fear of novel environments and people; therapy parrots are handled by a multitude of people; Capuchins have their teeth pulled out, and dogs held on a short leash around the clock. In all these cases the welfare of the animal, its ability to control its environment and make personal choices as other pets do, are significantly hampered for the benefit of the welfare of the human they serve. The welfare of assistance animals is currently not being thoroughly considered or protected. Due to the rapidly increasing numbers of animals being used for such purposes, legislation or ethical guidelines should be promoted, pertaining to the training, work periods and retirement years of these animals. These need to relate not only to limiting the harm to the animals' welfare during their service, but also address the suitability (or lack thereof) of certain species for service work.

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Diffusion of Precision Livestock Farming in Italian dairy industry and its perception related to animal welfare. Preliminary results

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Abstract: Precision Livestock Farming (PLF) permits an automated and continuous monitoring of the status of animals and their environment, to improve productivity and welfare detecting health issues at an early stage [1,2]. A questionnaire was created to investigate the diffusion of PLF, the motivations to invest in these systems, the implication for animal welfare, and the needs that PLF could address. The sample totalled 112 respondents. 38% of farms were located in Lombardy region followed by Emilia Romagna region (30%). 72% of respondents was the farm's owner and 54% produced milk for human consumption. In 59% of the farms, PLF was installed (sensors on animal or environmental level, or both), and mainly for cows during lactation. Cost was considered the main barrier to invest in PLF. 93% of farmers answered that PLF technology installed in their farms improved the animal welfare. Despite the possible risks for animal welfare was not a concern for almost all respondents, 71% agreed regarding the substitution of PLF animal sensors with a technology not wearable on animals but giving the same information. Most of respondents expected future technology to focus immediately on animal welfare following by having multiple simultaneous integrated sensors. Despite the key role of PLF technology in improving animal welfare was recognized by the most of respondents, its diffusion is still limited, probably because of costs and because it doesn't fully meet farmers' needs. [3]. Some efforts are requiring to integrate PLF data into an automated system also to assess animal welfare directly [4,5].

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References

1. Berckmans, D. Precision livestock farming technologies for welfare management in intensive livestock systems. *Revue scientifique et technique*, 2014, 33(1), 189-196.
2. Schillings, J.; Bennett, R.; Rose, D. C. Exploring the potential of precision livestock farming technologies to help address farm animal welfare. *Frontiers in Animal Science*, 2021, 2.
3. Bianchi, M.C.; Bava, L.; Sandrucci, A.; Tangorra, F. M.; Tamburini, A.; Gislou, G.; Zucali, M. Diffusion of precision livestock farming technologies in dairy cattle farms. *Animal*, 2022, 16(11), 100650.
4. Buller, H.; Blokhuis, H.; Lokhorst, K.; Silberberg, M.; Veissier, I. Animal welfare management in a digital world. *Animals*, 2020, 10(10), 1779.
5. Van Erp-van der Kooij, E.; Rutter, S.M. Using precision farming to improve animal welfare. *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources*, 2020, 15, 1-10.

Differences in the ownership of brachycephalic dog breeds and non-brachycephalic dog breeds. Preliminary results

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Abstract: Popularity of brachycephalic dog breeds is increasing internationally despite well-documented intrinsic health and welfare problems associated with their conformation [1,2]. A questionnaire was created to explore characteristics, expectations, motivations and perceived reality of dog-owners who purchase brachycephalic dog breeds (i.e. English and French bulldog, and Pug) (BDOs) compared to dog-owners of non-brachycephalic dog breeds (NBDOs) [1,3]. Mann-Whitney U tests were performed. The sample totalled 728 respondents (320 BDOs; 408 NBDOs). Age range of BDOs resulted higher than NBDOs (45-54 years) ($P<0.05$). In the brachycephalic group non-sterilized animals were the majority. 69% of dogs purchased from non-certified breeder and 88% purchased from web or shop belonged to brachycephalic breeds ($P<0.05$). The most satisfied owners about commitment request had a non-brachycephalic breed (66%) whereas 52% of BDOs were more than satisfied with the general behaviour ($P<0.05$). Brachycephalic dogs were attacked more frequently than non-brachycephalic ones by other dogs (73%) ($P<0.05$). Regarding clinical disorders in brachycephalic group, the most frequent symptoms were snoring (39%) followed by breathing distress during hot climatic conditions. The most frequent diagnoses were gastroenteric disorders (22%) followed by neurologic disorders (21%) and BOAS (20%). 31% of brachycephalic dogs had undergone conformation-related surgeries. 44% of BDOs considered the health status of their dog as good. The main motivation for acquiring these breeds was the character (94%). These preliminary results are in line with other studies [4-6]. Further analysis will be performed to explore the dog-human relationship and behavioural aspects to expand the knowledge on the complex phenomenon of brachycephalic ownership.

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References

1. Packer, R.M.; O'Neill, D.G.; Fletcher, F.; Farnworth, M. J. Great expectations, inconvenient truths, and the paradoxes of the dog-owner relationship for owners of brachycephalic dogs. *PLoS One*, 2019, 14(7), e0219918.
2. O'Neill, D.G.; Pegram, C.; Crocker, P.; Brodbelt, D.C.; Church, D.B.; Packer, R. M. A. Unravelling the health status of brachycephalic dogs in the UK using multivariable analysis. *Scientific Reports*, 2020, 10(1), 1-13.
3. Berteselli, G.V.; Palestrini, C.; Scarpazza, F.; Barbieri, S.; Prato-Previde, E.; Cannas, S. Flat-Faced or Non-Flat-Faced Cats? That is the Question. *Animals*, 2023, 13(2), 206.
4. Steinert, K.; Kuhne, F.; Kramer, M.; Hackbarth, H. People's perception of brachycephalic breeds and breed-related welfare problems in Germany. *Journal of Veterinary Behavior: Clinical Applications and Research*, 2019, 33, 96-102.
5. Packer, R.M.A.; Murphy, D.; Farnworth, M.J. Purchasing popular purebreds: investigating the influence of breed-type on the pre-purchase motivations and behaviour of dog owners. *Animal Welfare*, 2017, 26(2), 191-201.
6. Sandøe, P.; Kondrup, S.V.; Bennett, P.C.; Forkman, B.; Meyer, I.; Proschowsky, H.F.; Serpell, J.A.; Lund, T.B. Why do people buy dogs with potential welfare problems related to extreme conformation and inherited disease? A representative study of Danish owners of four small dog breeds. *PLoS ONE*, 2017, 12(2), e0172091

Anxiety and aggressive behavior as initial presentation of lipofuscinosis in an Australian Shepherd dog

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Abstract: A 16-month-old, intact female Australian shepherd dog was evaluated for anxiety and aggression-related disorders. She had been bought from a breeder at 64 days of life. She immediately showed legs' biting and agitation, and behavioural problems worsened gradually over time. She then developed severe anxiety manifestations when descending the stairs, few episodes of aggression toward her owner during the on-leash walking without specific trigger, and inappropriate urine elimination. A behavioural evaluation was requested. CBC, serum biochemical analysis, and thyroid profile were unremarkable. Generalized anxiety and anxiety-related aggression were diagnosed [1-3]. Behaviour modification therapy was implemented in association with clomipramine administration (1.5 mg/kg PO BID) [1,2]. After 21 days of treatment the symptoms had worsened: the dog was more anxious, refused to walk down the stairs, and developed an oral compulsion. The medication was dropped. The dog became progressively depressed and showed cognitive decline; reduced vision was suspected. A neurologic examination was then performed. The dog appeared dull, difficult to approach. She was blind and disoriented. A neurodegenerative disorder was suspected [4]. A DNA test from salivary swab confirmed homozygosity for CNL6 mutation [5]. The dog was euthanised due to poor prognosis. Neuronal ceroid lipofuscinosis is a rare, neurodegenerative disease that affects Australian Shepherds among other breeds. It leads to severe neurological signs, progressing to seizures and death or euthanasia [5]. Anxiety related behaviour and aggression with progression to prosencephalic neurologic signs should prompt genetic screening, when available, for storage diseases.

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References

1. Overall K. Abnormal canine behaviors and behavioral pathologies not primarily involving pathological aggression. In: Overall K, ed. *Manual of clinical behavioral medicine for dogs and cats*. Ed.; Elsevier Mosby: St Louis, MO, USA, 2013; pp 231-309.
2. Crowell-Davis, S.L. Generalized anxiety disorder. *Compendium: Continuing Education for Veterinarians*, 2009, 31, 427-430.
3. Reisner, I.R. Differential diagnosis and management of human-directed aggression in dogs. *Veterinary Clinics: Small Animal Practice*, 2003, 33(2), 303-320.
4. Overall, K.L. Medical differentials with potential behavioral manifestations. *Veterinary Clinics: Small Animal Practice* 2003, 33, 213-229.
5. Katz, M.L.; Farias, F.H.; Sanders, D.N.; Zeng, R.; Khan, S.; Johnson, G.S.; O'Brien, D.P. A Missense mutation in canine CLN6 in an Australian shepherd with neuronal ceroid lipofuscinosis. *Journal of Biomedicine and Biotechnology*, 2011, 2011:190842.

Toward a molecular selection of working dogs? A review of gene candidates and associated neurobiological systems

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Abstract: Working dogs are employed for diverse activities of human interest. Their behaviour traits influence their final performance and the cost of their training [1, 2]. Selection methods could benefit from animal genetic profile characterization. This review aims to study which gene candidates could be valuable. We searched scientific publications associating canine behavioural profiles and polymorphisms of several genes involved in neurotransmitters' reception, synthesis, secretion, and metabolism. We focused on three neurobiological systems known to modulate behaviours and emotions: (i) dopaminergic; (ii) serotonergic; (iii) oxytocinergic, encompassing 12 gene candidates and 49 associated genetic polymorphisms. The dopamine receptor D4 gene revealed various frequencies of alleles of different lengths among dog breeds [3, 4], associated with behavioural traits (reactivity, aggressiveness, activity- impulsivity) [5-7]. Genotype and allele frequencies of the dopamine transporter gene SLC6A3 varied among breeds with different temperaments and are associated with performance in detection dogs [8, 9]. Regarding catabolic enzymes, one allele frequency of the monoamine-oxidase B gene differed between friendly and aggressive/excitable breeds, while distinct polymorphisms of the monoamine-oxidase A genes were observed [10, 11]. Polymorphisms of biosynthetic enzyme genes exist and look promising for examining the genetics of canine behaviour [12]. As for serotonergic system genes (receptors: HTR1A/HTR1B/HTR2A/HTR2B; transporter: SLC6A4), polymorphisms between breeds and an association with performance in detection dogs for HTR2B were found [8, 13, 14]. Variations of the oxytocin receptor gene were associated with dogs' anxiety and socio-cognitive skills and influenced dog- human relationships (proximity, friendliness, fearfulness) [15-18]. Such studies support the interest of molecular genetics in the selection of working dogs.

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References

1. Brady, K.; Cracknell, N.; Zulch, H.; Mills, D.S. A systematic review of the reliability and validity of behavioural tests used to assess behavioural characteristics important in working dogs. *Front. Vet. Sci.* 2018, 5.
2. Mengoli, M.; Oliva, J.L.; Mendonça, T.; Chabaud, C.; Arroub, S.; Lafont-Lecuelle, C.; Cozzi, A.; Pageat, P.; Bienboire-Frosini, C. Neurohormonal Profiles of Assistance Dogs Compared to Pet Dogs: What Is the Impact of Different Lifestyles? *Animals* 2021, 11, 2594, doi:10.3390/ani11092594.
3. Niimi, Y.; Inoue-Murayama, M.; Murayama, Y.; Ito, S.; Iwasaki, T. Allelic Variation of the D4 Dopamine Receptor Polymorphic Region in Two Dog Breeds, Golden Retriever and Shiba. *J. Vet. Med. Sci.* 1999, 61, 1281–1286, doi:10.1292/jvms.61.1281.
4. Niimi, Y.; Inoue-Murayama, M.; Kato, K.; Matsuura, N.; Murayama, Y.; Ito, S.; Momoi, Y.; Konno, K.; Iwasaki, T. Breed differences in allele frequency of the dopamine receptor D4 gene in dogs. *J. Hered.* 2001, 92, 433–436, doi:10.1093/jhered/92.5.433.
5. Ito, H.; Nara, H.; Inoue-Murayama, M.; Shimada, M.K.; Koshimura, A.; Ueda, Y.; Kitagawa, H.; Takeuchi, Y.; Mori, Y.; Murayama, Y.; et al. Allele frequency distribution of the canine dopamine receptor D4 gene exon III and I in 23 breeds. *J. Vet. Med. Sci.* 2004, 66, 815–820, doi:10.1292/jvms.66.815.
6. Hejjas, K.; Vas, J.; Topal, J.; Szantai, E.; Ronai, Z.; Szekely, A.; Kubinyi, E.; Horvath, Z.; Sasvari-Szekely, M.; Miklosi, A. Association of polymorphisms in the dopamine D4 receptor gene and the activity- impulsivity endophenotype in dogs. *Anim. Genet.* 2007, 38, 629–633, doi:10.1111/j.1365-2052.2007.01657.x.
7. Hejjas, K.; Kubinyi, E.; Ronai, Z.; Szekely, A.; Vas, J.; Miklósi, Á.; Sasvari-Szekely, M.; Kereszturi, E. Molecular and behavioral analysis of the intron 2 repeat polymorphism in the canine dopamine D4 receptor gene. *Genes, Brain Behav.* 2009, 8, 330–336, doi:10.1111/j.1601-183X.2008.00475.x.
8. Sacharczuk, M.; Walczak, M.; Adamkiewicz, E.; Walasek, A.; Ensminger, J.; Presch, M.; Jezierski, T. Polymorphism of olfactory and neurotransmitters receptor genes in drug and explosives detection dogs can be associated with differences in detection performance. *Appl. Anim. Behav. Sci.* 2019, 215, 52–60, doi:10.1016/j.applanim.2019.04.006.
9. Arata, S.; Ogata, N.; Shimozuru, M.; Takeuchi, Y.; Mori, Y. Sequences and polymorphisms of the canine monoamine transporter genes SLC6A2, SLC6A3, and SLC6A4 among five dog breeds. *J. Vet. Med. Sci.* 2008, 70, 971–975, doi:10.1292/jvms.70.971.

10. Hashizume, C.; Masuda, K.; Momozawa, Y.; Kikusui, T.; Takeuchi, Y.; Mori, Y. Identification of a cysteine-to-arginine substitution caused by a single nucleotide polymorphism in the canine monoamine oxidase B gene. *J. Vet. Med. Sci.* 2005, 67, 199–201, doi:10.1292/jvms.67.199.
11. Sacco, J.; Ruplin, A.; Skonieczny, P.; Ohman, M. Polymorphisms in the canine monoamine oxidase a (MAOA) gene: identification and variation among five broad dog breed groups. *Canine Genet. Epidemiol.* 2017, 4, 1–8, doi:10.1186/s40575-016-0040-2.
12. Takeuchi, Y.; Hashizume, C.; Chon, E.M.H.; Momozawa, Y.; Masuda, K.; Kikusui, T.; Mori, Y. Canine Tyrosine Hydroxylase (TH) gene and Dopamine β -Hydroxylase (DBH) gene: Their sequences, genetic polymorphisms, and diversities among five different dog breeds. *J. Vet. Med. Sci.* 2005, 67, 861–867, doi:10.1292/jvms.67.861.
13. Van Den Berg, L.; Kwant, L.; Hestand, M.S.; Van Oost, B.A.; Leegwater, P.A.J. Structure and variation of three canine genes involved in serotonin binding and transport: The serotonin receptor 1A gene (htr1A), serotonin receptor 2A gene (htr2A), and serotonin transporter gene (slc6A4). *J. Hered.* 2005, 96, 786–796, doi:10.1093/jhered/esi108.
14. Van Den Berg, L.; Vos-Loohuis, M.; Schilder, M.B.H.; Van Oost, B.A.; Hazewinkel, H.A.W.; Wade, C.M.; Karlsson, E.K.; Lindblad-Toh, K.; Liinamo, A.E.; Leegwater, P.A.J. Evaluation of the serotonergic genes htr1A, htr1B, htr2A, and slc6A4 in aggressive behavior of Golden Retriever dogs. *Behav. Genet.* 2008, 38, 55–66, doi:10.1007/s10519-007-9179-7.
15. Kovács, K.; Virányi, Z.; Kis, A.; Turcsán, B.; Hudecz, Á.; Marmota, M.T.; Koller, D.; Rónai, Z.; Gácsi, M.; Topál, J. Dog- owner attachment is associated With oxytocin receptor gene polymorphisms in both parties. A comparative study on Austrian and Hungarian border collies. *Front. Psychol.* 2018, 9, 1–15, doi:10.3389/fpsyg.2018.00435.
16. Kis, A.; Bence, M.; Lakatos, G.; Pergel, E.; Turcsán, B.; Pluijmakers, J.; Vas, J.; Elek, Z.; Bröder, I.; Földi, L.; et al. Oxytocin Receptor Gene Polymorphisms Are Associated with Human Directed Social Behavior in Dogs (*Canis familiaris*). *PLoS One* 2014, 9, e83993, doi:10.1371/journal.pone.0083993.
17. Oláh, K.; Topál, J.; Kovács, K.; Kis, A.; Koller, D.; Park, S.Y.; Virányi, Z. Gaze-following and reaction to an aversive social interaction have corresponding associations with variation in the OXTR gene in dogs but not in human infants. *Front. Psychol.* 2017, 8, 1–13, doi:10.3389/fpsyg.2017.02156.
18. Bence, M.; Marx, P.; Szantai, E.; Kubinyi, E.; Ronai, Z.; Banlaki, Z. Lessons from the canine Oxt gene: Populations, variants and functional aspects. *Genes, Brain Behav.* 2017, 16, 427–438, doi:10.1111/gbb.12356.

Cannabidiol use guidelines in behavioral medicine in dogs: what do we know? An ESVCE working group study

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Abstract: An increasing number of dog owners are using products containing cannabidiol (CBD) as a natural, safe, and over-the-counter medication for behavioral conditions in dogs. To address this trend, an ESVCE working group analyzed the published evidence in order to propose guidelines for CBD use in dogs. Reviews and research papers from the last five years on the subject were analyzed in humans, laboratory animals, and dogs, as well as the legal use of the products. The results of CBD efficacy on human and laboratory animals' psychiatric conditions are eclectic and contradictory 2–5. Only two reviewed papers on CBD use in dogs for behavioral conditions have been published, and none are convincing 6,7. This lack of evidence may be due to the heterogeneity in the products and dosages used. Most European countries authorize the sale of CBD products over-the-counter as long as they do not include more than a small percentage of THC 8,9. Unfortunately, the majority do not specify their CBD, or other cannabinoids concentrations, which renders the analysis complex. There is a crucial need for standardized studies on the effects of CBD on behavioral conditions in dogs. Nevertheless, based on our current knowledge, the following guidelines are suggested: - Use products with a specified known dosage (mg/ml) specified; - Suggested starting dose of 2.5 mg/kg BID with a gradual increase up to 10 mg/kg BID if required; - Theoretical drugs interactions exist; - Monitor liver parameters, even when using an over-the-counter product livers parameters should be monitored 11

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References

1. Kogan, L. R., Hellyer, P. W., Silcox, S. & Schoenfeld-Tacher, R. Canadian dog owners' use and perceptions of cannabis products. *Can. Vet. J.* 60, 749 (2019).
2. Fliegel, D. K. & Lichenstein, S. D. Systematic literature review of human studies assessing the efficacy of cannabidiol for social anxiety. *Psychiatry Res. Commun.* 2, 100074 (2022).
3. García-Gutiérrez, M. S. et al. Cannabidiol: A Potential New Alternative for the Treatment of Anxiety, Depression, and Psychotic Disorders. *Biomolecules* 10, 1575 (2020).
4. Kwee, C. M. et al. Cannabidiol in clinical and preclinical anxiety research. A systematic review into concentration-effect relations using the IB-de-risk tool. *J. Psychopharmacol. (Oxf.)* 36, 1299–1314 (2022).
5. van Gerven, J. & Cohen, A. Integrating data from the Investigational Medicinal Product Dossier/investigator's brochure. A new tool for translational integration of preclinical effects. *Br. J. Clin. Pharmacol.* 84, 1457 (2018).
6. Corsetti, S. et al. Cannabis sativa L. may reduce aggressive behaviour towards humans in shelter dogs. *Sci. Rep.* 11, 2773 (2021).
7. Morris, E. M. et al. The Impact of Feeding Cannabidiol (CBD) Containing Treats on Canine Response to a Noise-Induced Fear Response Test. *Front. Vet. Sci.* 7, 690 (2020).
8. Is CBD Oil Legal In Europe? The EU Laws & Regulations Overview For 2023. <https://essentiaipura.com/is-cbd-oil-legal-in-europe/#austria> (2023).
9. Legal status of CBD around the world: List with countries. <https://www.kanawonders.com/legal-status-of-cbd-around-the-world/> (2021).
10. Almeida, V. et al. Cannabidiol exhibits anxiolytic but not antipsychotic property evaluated in the social interaction test. *Prog. Neuropsychopharmacol. Biol. Psychiatry* 41, 30–35 (2013).
11. Loewinger, M., Wakshlag, J. J., Bowden, D., Peters?Kennedy, J. & Rosenberg, A. The effect of a mixed cannabidiol and cannabidiolic acid based oil on client-owned dogs with atopic dermatitis. *Vet. Dermatol.* 33, 329-e77 (2022).

Potential risks of human-pet relationship: can a pet-friendly city prevent them?

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Abstract: There is an increasing number of pets globally. The beneficial effects of pet ownership have been extensively documented [1–3]; nevertheless, it may also lead to some potential risks. The aim of the current review was to identify possible risks of human-pet relationship. Literature search was conducted in March 2023 with Scopus using the following keywords: risk AND human-pet OR human-dog OR human-cat AND relationship OR ownership OR interaction. In total 110 papers were found; 88 of them were excluded by title being out of the scope. The remaining 22 were reviewed [4–25]. The most frequently reported risks were, respectively: zoonoses (bartonellosis, campylobacter, toxoplasmosis, toxocara canis), physical aggression (dog bites or cat's aggression), and behavioural problems in pets (aggressiveness, inappropriate elimination, destructive behaviour). Preventative measures should be included in the agenda of policy-makers; for instance, developing good practices to maintain public hygiene and co-managing off-leash areas, as well as promoting appropriate knowledge (e.g. educational projects in schools, introductory courses for pet owners organized by public administration, interventions in dog/cat shelters to increase responsible adoptions) to avoid aggression, occurrence of behavioural problems and free-roaming pets might be suitable solutions. A multi-disciplinary, evidence-based and integrated approach reduces the risk of ineffective attempts [26–28]. In this regard, the xxx project, funded by the European Commission (GA xxx), serves as a good example of an innovative framework that aims to reduce the risks associated with human-animal relationship in urban settings and create a pet-friendly city where benefits are maximized.

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References

1. McConnell, A.R.; Brown, C.M.; Shoda, T.M.; Stayton, L.E.; Martin, C.E. Friends with Benefits: On the Positive Consequences of Pet Ownership. *J Pers Soc Psychol* 2011, 101, 1239–1252, doi:10.1037/a0024506.

2. Friedmann, E.; Son, H. The Human-Companion Animal Bond: How Humans Benefit. *Veterinary Clinics of North America - Small Animal Practice* 2009, 39, 293–326, doi:10.1016/j.cvsm.2008.10.015.
3. Friedman, E.; Krause-Parello, C.A. Companion Animals and Human Health: Benefits, Challenges, and the Road Ahead for Human-Animal Interaction. *Rev Sci Tech* 2018, 37, 71–82, doi:10.20506/rst.37.1.2741.
4. Barrios, C.L.; Bustos-López, C.; Pavletic, C.; Parra, A.; Vidal, M.; Bowen, J.; Fajtj, J. Epidemiology of Dog Bite Incidents in Chile: Factors Related to the Patterns of Human-Dog Relationship. *Animals* 2021, 11, 1–25, doi:10.3390/ani11010096.
5. Joosten, P.; Van Cleven, A.; Sarrazin, S.; Paeppe, D.; De Sutter, A.; Dewulf, J. Dogs and Their Owners Have Frequent and Intensive Contact. *Int J Environ Res Public Health* 2020, 17, 1–10, doi:10.3390/ijerph17124300.
6. Overgaauw, P.A.M.; Vinke, C.M.; van Hagen, M.A.E.; Lipman, L.J.A. A One Health Perspective on the Human-Companion Animal Relationship with Emphasis on Zoonotic Aspects. *Int J Environ Res Public Health* 2020, 17, doi:10.3390/ijerph17113789.
7. Chan, M.M.; Tapia Rico, G. The “Pet Effect” in Cancer Patients: Risks and Benefits of Human-Pet Interaction. *Crit Rev Oncol Hematol* 2019, 143, 56–61, doi:10.1016/j.critrevonc.2019.08.004.
8. Rezaieanesh, M.R.; Afzalaghaee, M.; Hamidi, S.; Eshaghzadeh, A.; Paydar, M.; Hejazi, S.H. Prevalence of Toxocariasis and Its Related Risk Factors in Humans, Dogs and Cats in Northeastern Iran: A Population-Based Study. *Trans R Soc Trop Med Hyg* 2019, 113, 399–409, doi:10.1093/trstmh/trz011.
9. Kardjadj, M.; Ben-Mahdi, M.H. Epidemiology of Dog-Mediated Zoonotic Diseases in Algeria: A One Health Control Approach. *New Microbes New Infect* 2019, 28, 17–20, doi:10.1016/j.nmni.2019.01.001.
10. Ingram, K.M.; Cohen-Filipic, J. Benefits, Challenges, and Needs of People Living with Cancer and Their Companion Dogs: An Exploratory Study. *J Psychosoc Oncol* 2019, 37, 110–126, doi:10.1080/07347332.2018.1529010.
11. Utaaker, K.S.; Tysnes, K.R.; Krosness, M.M.; Robertson, L.J. Not Just a Walk in the Park: Occurrence of Intestinal Parasites in Dogs Roaming Recreational Parks in Chandigarh, Northern India. *Vet Parasitol Reg Stud Reports* 2018, 14, 176–180, doi:10.1016/j.vprsr.2018.10.008.
12. Meints, K.; Brelsford, V.; Keuster, T.D. Teaching Children and Parents to Understand Dog Signaling. *Front Vet Sci* 2018, 5, doi:10.3389/fvets.2018.00257.
13. Shah, S.S.A.; Khan, M.I.; Rafiullah; Khan, M.A.; Khan, H.; Ali, A.; Ali, M.I.; Jan, R. Tick-Borne Diseases-Possible Threat to Humans-Dog Interspecies Bond. *Adv Anim Vet Sci* 2017, 5, 115–120, doi:10.14737/journal.aavs/2017/5.3.115.120.
14. Patronek, G.J.; Sacks, J.J.; Delise, K.M.; Cleary, D. V.; Marder, A.R. Co-Occurrence of Potentially Preventable Factors in 256 Dog Bite-Related Fatalities in the United States (2000-2009). *J Am Vet Med Assoc* 2013, 243, 1726–1736, doi:10.2460/javma.243.12.1726.
15. Elad, D. Immunocompromised Patients and Their Pets: Still Best Friends? *Veterinary Journal* 2013, 197, 662–669, doi:10.1016/j.tvjl.2013.05.042.
16. Lunney, M.; Jones, A.; Stiles, E.; Waltner-Toews, D. Assessing Human-Dog Conflicts in Todos Santos, Guatemala: Bite Incidences and Public Perception. *Prev Vet Med* 2011, 102, 315–320, doi:10.1016/j.prevetmed.2011.07.017.
17. Ramos, D.; Mills, D.S. Human Directed Aggression in Brazilian Domestic Cats: Owner Reported Prevalence, Contexts and Risk Factors. *J Feline Med Surg* 2009, 11, 835–841, doi:10.1016/j.jfms.2009.04.006.
18. Friedmann, E.; Son, H. The Human- Companion Animal Bond: How Humans Benefit. *Veterinary Clinics of North America - Small Animal Practice* 2009, 39, 293–326, doi:10.1016/j.cvsm.2008.10.015.
19. Reaser, J.K.; Clark Jr., E.E.; Meyers, N.M. All Creatures Great and Minute: A Public Policy Primer for Companion Animal Zoonoses. *Zoonoses Public Health* 2008, 55, 385–401, doi:10.1111/j.1863-2378.2008.01123.x.
20. Seksel, K. Preventing Behavior Problems in Puppies and Kittens. *Veterinary Clinics of North America - Small Animal Practice* 2008, 38, 971–982, doi:10.1016/j.cvsm.2008.04.003.
21. Shore, E.R.; Burdsal, C.; Douglas, D.K. Pet Owners’ Views of Pet Behavior Problems and Willingness to Consult Experts for Assistance. *Journal of Applied Animal Welfare Science* 2008, 11, 63–73, doi:10.1080/10888700701729221.
22. Bender, J.B.; Minicucci, L. Diseases Pets and People Share. *Minn Med* 2007, 90, 43–47.
23. Weng, H.Y.; Kass, P.H.; Hart, L.A.; Chomel, B.B. Risk Factors for Unsuccessful Dog Ownership: An Epidemiologic Study in Taiwan. *Prev Vet Med* 2006, 77, 82–95, doi:10.1016/j.prevetmed.2006.06.004.
24. Mayon-White, R. Commentary: Pets-Pleasures and Problems. *Br Med J* 2005, 331, 1254–1255.
25. Love, M.; Overall, K.L. How Anticipating Relationships between Dogs and Children Can Help Prevent Disasters. *J Am Vet Med Assoc* 2001, 219, 446–453, doi:10.2460/javma.2001.219.446.
26. Gary J. Patronek, M.S.A.M. Use of a Number-Needed-to-Ban Calculation to Illustrate Limitations of Breed-Specific Legislation in Decreasing the Risk of Dog Bite-Related Injury. *JAVMA* 2010, 237, 788–792.
27. Creedon, N.; Ó’Súilleabháin, P.S. Dog Bite Injuries to Humans and the Use of Breed-Specific Legislation: A Comparison of Bites from Legislated and Non-Legislated Dog Breeds. *Ir Vet J* 2017, 70, doi:10.1186/s13620-017-0101-1.
28. Mariti, C.; Ciceroni, C.; Sighieri, C. Italian Breed-Specific Legislation on Potentially Dangerous Dogs (2003): Assessment of Its Effects in the City of Florence (Italy). *Dog Behavior* 2015, 1, 25–31.

A legislative perspective on traditional reindeer slaughter in Sweden and Norway

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Abstract: Herding of free-ranging reindeer is associated with long traditions of the indigenous sami people. Reindeer slaughter serves both as a source of income and a living heritage. In this study we perform a legislative comparison between Sweden and Norway, focusing on the use of krumkniv as a potential stunning method in traditional reindeer slaughter. A krumkniv is a curved knife which is stabbed into foramen magnum, similar to puntilla, with the aim of damaging the brain stem. With Sweden being an EU member state and Norway being part of the EFTA agreement, the regulations EC 1099/2009 is applicable and puntilla not approved [1]. However, for traditional reindeer slaughter intended for private consumption, the two neighbouring states have come to different conclusions. Today, krumkniv is approved in Norway, with specified requirements concerning the shape of the knife and documented training [2]. In Sweden, the use of krumkniv is completely prohibited [3], as it is not considered to produce a sufficient stun repeatedly. Using legislative literature, we have identified two main explanations for the differences in the judicial status of the krumkniv; 1) different conclusions regarding the krumkniv effect from an animal welfare perspective, and 2) if the use of krumkniv is a cultural tradition and object of exception through Article 1.3 in EC 1099/2009 or not. Furthermore, the historical context differs between the countries. Due to lack of scientific studies on the animal welfare aspects, we conclude that precautionary principles should be applied in legislative decisions on the use of krumkniv.

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References

1. European Commission. Council Regulation (EC) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing. 2009.
2. Mattilsynet. Foreskrift om bruk av krumkniv (FOR-2008-07-30-866). 2008.
3. Jordbruksverket. Föreskrifter om ändring i Statens jordbruksverks föreskrifter och allmänna råd (SJVFS 2019:8) om slakt och annan avlivning av djur, SJVFS 2020:22. 2020.

Chicken-human interaction: can broiler chickens reduce their fear responses towards humans through social learning?

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Abstract: Observational social learning has a solid adaptive value and can influence several behaviors in chickens^{1,2}. We aimed to determine if broiler chickens can learn to perceive positively a human through the observation of a conspecific demonstrator receiving gentle handling. One-day-old male broiler chickens were assigned to one of three treatments (2 pens/treatment, 24 chickens/treatment). 1) Gentle Handling (GH): one bird per pen was randomly chosen to be a demonstrator exposed to gentle handling by the experimenter while the penmates (observers) witnessed the development of a positive human-chicken relationship through a wire mesh divider. 2) Human Presence (HP): the birds were exposed to human visual contact. 3) Control (CT): no additional human contact. At days 31-32 of age, the animals were tested in their home pen. The experimenter entered the pen and sat for 5 minutes; no wire mesh divider was used. The pen was virtually divided into 3 zones (75 cm long/each): distal, middle, and proximal relative to the experimenter. Behavioral responses were analyzed using general linear models.

Observer chickens of GH spent more time in the proximal zone compared to the CT ($p=0.0004$) and HP ($p=0.005$). Chickens of GH took less time to enter the proximal zone compared to CT ($p=0.002$) and HP ($p=0.02$). Also, CT chickens spent more time alert compared to GH ($p=0.001$) and HP ($p=0.0002$). Fear of the experimenter was reduced, and voluntary approach was encouraged in GH observers after witnessing a penmate being treated gently. In conclusion, observational social learning facilitated the acquisition of a positive human perception by the chickens.

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References

1. Nicol, C. J.; Pope, S.J. Social learning in small flocks of laying hens. *Anim. Behav* 1994, 47, 1289-1296.
2. Rosa Salva, O.; Daisley, J.N.; Regolin, L.; Vallortigara, G. Time-dependent lateralization of social learning in the domestic chick (*Gallus gallus domesticus*): Effects of retention delays in the observed lateralization pattern. *Behav Brain Res* 2010, 212, 152-158.

A welfare assessment for guide dogs

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Abstract: Rearing and training guide dogs is costly in terms of time, effort, and resources. Besides, the failure rate of training remains high and mainly for behavioural reasons [1,2]. Proper welfare management is important for achieving high performances, and finding ways to predict the success of a guide dog is the subject of much literature [2]. Additionally, the expansion of this generation of working animals raises public concern and organisations make it a priority to respect high welfare standards [3]. The aim of the authors is to share a welfare assessment approach for guide dogs. The Frédéric Gaillanne Foundation (France) raises and trains guide dogs for blind children. The agreement between the foundation and IRSEA involves periodic audits to identify environment, management, training, and cares related factors that may interfere with the dogs' welfare. The training program is made of several phases and audits are therefore planned at the kennel, during training and sessions involving foster families. The housing conditions, the daily activities, the behaviour of the dogs and the role of foster families are examples of issues discussed with the staff. The foundation receives advice on best practices while showing the authorities its commitment to protecting dogs' welfare. To conclude, such a collaboration could inspire other organisations employing assistance dogs. The development of a protocol integrating measures on welfare status, cognitive and behavioural capacities, training, and management practices could be interesting. Such a standardised method could help prevent problems and add knowledge in the field of assistance dogs' welfare.

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References

1. Marcato, M.; Kenny, J.; O'Riordan, R.; O'Mahony, C.; O'Flynn, B.; Galvin, P. Assistance dog selection and performance assessment methods using behavioural and physiological tools and devices. *Applied Animal Behaviour Science* 2022, 254, 105691.
2. Menuge, F.; Marcet-Rius, M.; Jochem, M.; François, O.; Assali, C.; Chabaud, C.; Teruel, E.; Guillemot, G.; Pageat, P. Early Evaluation of Fearfulness in Future Guide Dogs for Blind People. *Animals* 2021, 11(2), 412.
3. Tedeschi, P.; Pearson, J. A.; Bayly, D.; Fine, A. H. On call 24/7—The emerging roles of service and support animals. In *Handbook on animal-assisted therapy*, 4th ed; Academic Press, 2015; pp. 321-332.

Behaviour Modification strategies for safeguarding a dog's emotional welfare during air travel

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Abstract: This case study centres around a 3-year-old, entire male Lagotto Romagnolo dog relocating from Abu Dhabi, UAE to Melbourne, Australia. Abu Dhabi has a considerable expatriate population, with many owners exporting and importing their pets, making it a hub for global relocation services. Many pets experience stress during air travel [1] and this case study emphasises the importance of aiming to achieve a positive emotional state throughout the dog's air travel journey. The emotional resilience of the pet was considered during preparation for and execution of travel, as well as upon arrival, which included time spent in kennels in the country of origin, quarantine at the destination as well as in person owner consultations prior to and virtual consultations after the dog's arrival. When considering pet air travel, a global, collaborative approach is necessary to ensure emotional welfare. The assessment of animal welfare was previously focused on physiological health whereas, currently, welfare includes feelings of contentment, and a holistic approach to the animal [2]. The learning methods used to create positive emotional responses were not centred around operant conditioning alone, but rather included the application and interplay of counter conditioning, classical conditioning, predictive learning and desensitization for every potential stimulus the dog would encounter on the journey. Positive emotional responses were sought for every aspect of the journey including entering and comfort in the crate and habituation to airplane noise. Each facet of the journey was identified, incorporated, and formed the basis for the behaviour modification and training plan.

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References

1. Bergeron, R. et al. Physiology and behavior of dogs during air transport. *Canadian Journal of Veterinary Research* 2002, 66(3), 211–216.
2. Brando, S. Animal Learning and Training: Implications for Animal Welfare. *Veterinary Clinics of North America: Exotic Animal Practice* 2012, 15(1), 387-398.

An Italian survey addressed to shelters' workers: observations and opinions about shelter dogs behavioural problems and shelter features affecting dog welfare

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Abstract: Welfare and management of shelter dog population is a critical issue in Italy especially due to shelter overcrowding [1]. This study aims to collect perceptions and observations about factors that may affect shelter dogs' behaviour and welfare, from people working in Italian dog shelters. A questionnaire was developed and distributed via an online platform. 287 surveys were analyzed using both quantitative and qualitative methods. 83.28% of survey respondents were women, the participants' mean age was 42.35 years and 76.66% of them were volunteers. Results highlighted that the most frequent dog behavioural problems, observed by shelters' workers, were incessant barking (34.84%), hyperactivity (32.06%), destructive behaviour (27.53%), and aggressive behaviour towards unknown dogs (25.78%).

Moreover, respondents pointed out some shelter characteristics that they consider highly important in order to mitigate negative effects on dog welfare: quality of social contacts with humans, planning of an educational program based on the individual needs of each dog, presence of specific professional profiles and staff training had the highest scores. In general, our results about the type of shelter dogs' behavioural problems confirmed previous studies [2, 3, 4]. Above all, our respondents declared problems related to barking and hyperactivity, which are two indicators of poor welfare for kennelled dogs [5]. The opinion of our respondents about the key role of human-animal interactions for shelter dogs' welfare was confirmed by other studies [6, 7] while both the impact of the presence of specific professional profiles and the staff training on dog welfare need further investigation.

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References

1. Menchetti, L.; Mancini, S.; Catalani, M. C.; Boccini, B.; Diverio, S. RandAgiamo™, a pilot project increasing adoptability of shelter dogs in the Umbria Region (Italy). *Animals*, 2015, 5(3), 774-792.
2. Wells, D.L.; Graham, L.; Hepper, P.G. The influence of the length of time in a rescue shelter on the behaviour of kennelled dogs. *Animal Welfare*, 2002, 11, 317-325.
3. Normando, S.; Di Raimondo, G.; Bellaio, E. An investigation using different data gathering methods into the prevalence of behavioral problems in shelter dogs—A pilot study. *Journal of Veterinary Behavior*, 2019, 30, 1-8.
4. Protopopova, A.; Mehrkam, L.R.; Boggess, M.M.; Wynne, C.D.L. In-kennel behavior predicts length of stay in shelter dogs. *PLoS ONE* 2014, 9, e114319.
5. Protopopova, A.; Hauser, H.; Goldman, K. J.; Wynne, C. D. The effects of exercise and calm interactions on in-kennel behavior of shelter dogs. *Behavioural processes*, 2018, 146, 54-60.
6. Bergamasco, L.; Osella, M. C.; Savarino, P.; Larosa, G.; Ozella, L.; Manassero, M.; Re, G. Heart rate variability and saliva cortisol assessment in shelter dog: Human-animal interaction effects. *Applied animal behaviour science*, 2010, 125(1-2), 56-68.
7. Willen, R. M.; Schiml, P. A.; Hennessy, M. B. Enrichment centered on human interaction moderates fear-induced aggression and increases positive expectancy in fearful shelter dogs. *Applied Animal Behaviour Science*, 2019, 217, 57-62.

Edible insects as food in Europe - state of art

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Abstract: The agri-food system is facing numerous challenges, from climate change to the increasing demand for food and the important objective of achieving sustainability [1, 2]. Edible insects present numerous advantages, and they can be a precious ally for the agri-food system [3-6]. In comparison with conventional livestock, they required less water, land, and low nutritional feeds, therefore food by-products and former foodstuffs can be used as substrates [7, 8]. Following the EU legislation, edible insects are considered novel food (Regulation 2015/2283), namely food products that did not have a significant history of consumption before May 1997. For their place on market, as the first step producers must present an application, and then this must be evaluated by the European Commission, supported by European Food Safety Authority (EFSA). Since 2018 sixteen applications for novel food containing insects were presented, of which at the moment 6 (37.5%) were authorized. These six authorizations deal with four different insect species (*Tenebrio molitor*, *Acheta domesticus*, *Locusta migratoria*, and *Alphitobius diaperinus*) and range different food categories from baked goods, pasta, and soups to meat imitates. The growing interest of consumers will likely unleash the insect potentiality increasing the variety of products reaching our tables. However, the perspective of an increase in the use of edible insects must be accompanied by a debate led by the scientific community, taking into consideration the welfare of this unconventional livestock (moving forward the concept of animal welfare), as well as ethical and ecological frameworks, to impact the legislation and consumers' choices.

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References

1. van Dijk, M., Morley, T., Rau, M. L., & Saghai, Y. (2021). A meta-analysis of projected global food demand and population at risk of hunger for the period 2010–2050. *Nature Food*, 2(7), 494-501.
2. Moruzzo, R., Mancini, S., & Guidi, A. (2021). Edible insects and sustainable development goals. *Insects*, 12(6), 557.
3. van Huis, A., van Itterbeeck, J., Klunder, H., Mertens, E., Halloran, A., Muir, G., & Vantomme, P. (2013). Edible insects: future prospects for food and feed security (No. 171). Food and agriculture organization of the United Nations.
4. Dobermann, D., Swift, J. A., & Field, L. M. (2017). Opportunities and hurdles of edible insects for food and feed. *Nutrition Bulletin*, 42(4), 293-308.
5. Halloran, A., Flore, R., Vantomme, P., & Roos, N. (2018). Edible insects in sustainable food systems. Eds.; Springer: Berlin, Germany.
6. van Huis, A., & Oonincx, D. G. (2017). The environmental sustainability of insects as food and feed. A review. *Agronomy for Sustainable Development*, 37, 1-14.
7. van Huis, A., Rumpold, B. A., van der Fels-Klerx, H. J., & Tomberlin, J. K. (2021). Advancing edible insects as food and feed in a circular economy. *Journal of Insects as Food and Feed*, 7(5), 935-948.
8. Mancini, S., Fratini, F., Turchi, B., Mattioli, S., Dal Bosco, A., Tuccinardi, T., Nozic, S. & Paci, G. (2019). Former foodstuff products in *Tenebrio molitor* rearing: Effects on growth, chemical composition, microbiological load, and antioxidant status. *Animals*, 9(8), 484.

Trauma Informed Care- Is this a useful concept when considering the impact of adverse early experience in puppies?

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Abstract: Understanding ACEs [1] and the associated physiological and psychological stress has guided understanding of the long-term mental and physical consequences of early trauma in humans. [2] This approach ‘trauma informed care (TIC)’ has been utilised in a range of clinical and social science settings [3]. Would equivalent appreciation of the physiological and neuro-developmental effects of early trauma in puppies assist in future safeguarding of puppies? This review consider searches on PTSD, ACE, TIC and early development and trauma in puppies. During the neurodevelopmental landmark phases of puppy development it is vital that puppies and dams be exposed to humane conditions, minimising risk of stress and fear [4]. Puppies born to dams experiencing high/chronic stress during gestation [5]; those exposed to lacking “mothering” behaviours [6] and those separated early from their dam/littermates [7], followed by transport [8], with associated social/ environmental stress, are both medically and psychologically vulnerable [5]. The TIC approach includes: realisation of how ACEs affect health; recognition of paediatric clinical symptom presentation, screening protocols for ACEs and the health care provider’s ability to respond without re-traumatising patients when delivering evidence-based care [2]. While we must recognise cognitive differences between species which may affect psychological representational processes, there are comparisons to be considered between documented effects of PTSD in both humans and animals. The application of intervention strategies which attempt to compensate for the effects of trauma [9]: active coping, learned control and increasing resilience [10], may be useful in designing and implementing treatment strategies for dogs who have experienced trauma in puppyhood.

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References

1. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the Adverse Childhood Experiences (ACE) Study. *Am J Prev Med*. 1998;14(4):245-258.

2. Goddard, A. 2021, "Adverse Childhood Experiences and Trauma-Informed Care", *Journal of pediatric health care*, vol. 35, no. 2, pp. 145-155.
3. Overall, K.L. 2017, "Interventions for Early Puppy and Kitten Trauma and Neglect", *Advances in small animal medicine and surgery*, vol. 30, no. 3, pp. 1-3.
4. Sullivan, K.M., Murray, K.J. & Ake, G.S. 2016, "Trauma-Informed Care for Children in the Child Welfare System: An Initial Evaluation of a Trauma-Informed Parenting Workshop", *Child maltreatment*, vol. 21, no. 2, pp. 147-155.
5. Debiec, J. & Sullivan, R.M. 2014, "Intergenerational transmission of emotional trauma through amygdala-dependent mother-to-infant transfer of specific fear", *Proceedings of the National Academy of Sciences - PNAS*, vol. 111, no. 33, pp. 12222-12227.
6. Wauthier, L.M., Scottish Society for the Prevention of Cruelty to Animals (Scottish SPCA) & Williams, J.M. 2018, "Using the mini C-BARQ to investigate the effects of puppy farming on dog behaviour", *Applied animal behaviour science*, vol. 206, pp. 75-86.
7. Aguggia, J.P., Suárez, M.M. & Rivarola, M.A. 2019, "Multiparity Dampened the Neurobehavioral Consequences of Mother-Pup Separation Stress in Dams", *Neuroscience*, vol. 416, pp. 207-220.
8. Romaniuk, A.C., Diana, A., Barnard, S., Weller, J.E., Espinosa, U.B., Dangoudoubiyam, S., Shreyer, T., Arnott, G. & Croney, C. 2022, "The Effect of Transportation on Puppy Welfare from Commercial Breeding Kennels to a Distributor", *Animals (Basel)*, vol. 12, no. 23, pp. 3379.
9. Daskalakis, N.P., Yehuda, R. and Diamond, D.M., 2013. Animal models in translational studies of PTSD. *Psychoneuroendocrinology*, 38(9), pp.1895-1911.
10. Nagasawa, M., Shibata, Y., Yonezawa, A., Takahashi, T., Kanai, M., Ohtsuka, H., Suenaga, Y., Yabana, Y., Mogi, K. & Kikusui, T. 2021, "Basal cortisol concentrations related to maternal behavior during puppy development predict post-growth resilience in dogs", *Hormones and behavior*, vol. 136, pp. 105055-105055.

Paroxetine as a pharmacological alternative in behavioral problems: a retrospective study

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Abstract: The objective of this scientific communication is the retrospective evaluation of 66 cases of dogs with behavior problems treated with paroxetine. **MATERIALS AND METHODS** Data were collected from 66 dogs treated with paroxetine from 4 behavior centers about their diagnosis, treatment time, drug dose, reason for paroxetine use, treatments with which it was combined, score of improvement perceived by the clinician and their adverse effects. **RESULTS** Most cases presented more than one behavioral problem. The more prevalent diagnosis was fear aggression towards unknown dogs (45.45%, n=30), fear aggression toward nonfamily members (31.81%, n=21), environmental phobia (30%, n=20), unfamiliar people phobia (25.76%, n=17), Social conflict aggression: (22.72%, n=15), ADHD-like (12.12%, n=8). Paroxetine was combined with another drugs (n=61, 92%), behavior management guidelines (n=66, 100%) and a desensitization and counterconditioning program (n=37, 656%). The effect perceived by the clinician was worsening (n= 6, 8.95%), without effect (n=6, 8.95%), minimal improvement (n=6, 8.95%), moderate improvement (n=26, 38.80%) and marked improvement (n=23, 34.33%). Identified adverse effects were worsening of the behavior problems (n=2, 3.03%) and GI symptoms as loss of appetite, vomiting, or diarrhea (n=3, 4.54%) **DISCUSSION AND CONCLUSIONS:** Despite the limited published researches on the use of paroxetine in dogs [1, 2, 3], these results show that paroxetine could be a drug for safe use and effective for the treatment of behavior problems in dogs in combination with management guidelines and behavior modification. Nevertheless, more studies are necessary to establish the benefits of the administration of paroxetine with respect to other drugs.

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References

1. Reisner IR. Diagnosis of canine generalized anxiety disorder and its management with behavioral modification and fluoxetine or paroxetine: a retrospective summary of clinical experience (2001-2003). *J Am Hosp Assoc.* 2003,39:512.
2. Yokota S, Ishikura Y, Ono H. Cardiovascular effects of paroxetine, a newly developed antidepressant, in anesthetized dogs in comparison with those of imipramine, amitriptyline and clomipramine. *Jpn J Pharmacol.* 1987,45(3):335-342.
3. Dinwoodie, I. R., Zottola, V., & Dodman, N. H. An investigation into the effectiveness of various professionals and behavior modification programs, with or without medication, for the treatment of canine fears. *J Vet Behav.* 2022, 55, 1-6.

Natural conflict resolution in animal kingdom: from ethology to animal welfare and behavioural medicine

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Abstract: The purpose of this review is to show how an ethological topic can influence the welfare of an individual or a group of animals and which valuable concepts could be applied in behavioural medicine. The knowledge of how animals manage their conflicts is essential for understanding the dynamics of social systems (1). The mechanisms of conflict management, mainly on friendly post-conflict reunions (also called 'reconciliation') consist of the exchange of affiliative behaviours between opponents just after the end of an aggressive conflict (2). This mechanism impacts the life of the individuals in a social group. The literature of the last thirty years showed that this field is described in many species with interesting results (2). Besides, it opened interesting perspectives to understand better different processes in animals: the strategies to avoid or manage aggressions, the mechanisms to decrease stress in a group, how to analyze prosocial behaviours, how to evaluate the value of a relationship between individuals, which cognitive abilities are required for a species to manage the conflicts of interest in a social group or which kind of neurotransmitters could be involved in the social dynamics. In conclusion, the social context can influence the strategies that animals can use to manage a conflict (3-4). Finally, the nature of social interactions during a conflict resolution could have practical implications in the management of domestic species (5).

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References

1. Aureli, F.; Cords, M.; van Schaik, C.P. Conflict resolution following aggression in gregarious animals: a predictive framework. *Animal Behaviour* 2002, 64, 3, 325-343.
2. Aureli, F.; de Waal F.B.M. *Natural conflict resolution*. University of California Press, Ltd, London, England, 2000, 177-198.
3. Cafazzo, S.; Marshall-Pescini S.; Lazzaroni M.; Virányi Z.; Range F. The effect of domestication on post-conflict management: wolves reconcile while dogs avoid each other. *R. Soc. open sci* 2018, 5, 171553
4. Cools, A.K.A.; Van Hout, A.J.M.; Nelissen, M.H.J. Canine Reconciliation and Third-Party-Initiated Postconflict Affiliation: Do Peacemaking Social Mechanisms in Dogs Rival Those of Higher Primates? *Ethology* 2008, 114, 1, 53-63.
5. Cozzi A.; Sighieri, C.; Gazzano, A.; Nicol, C.J.; Baragli, P. Post-conflict friendly reunion in a permanent group of horses (*Equus caballus*). *Behavioural Processes* 2010, 85, 185-190.

Improving donkey welfare through education: one year of the donkey academy

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Abstract: Education, in the broadest sense of creating awareness and facilitating change, can contribute to improve animal welfare [1]. With this in mind, in January 2022, The Donkey Sanctuary launched The Donkey Academy, a Virtual Learning Environment, hosted on Canvas platform, which offers free education and training resources on donkeys and mule care, aimed at improving donkey welfare through the provision of evidenced based knowledge to owners, professionals and the public. Twenty-two courses, covering different topics, such as behaviour, care and welfare, nutrition, harness, clinic, dentistry and farriery, were available. Nineteen courses were accessible to the public; clinical, dentistry and farriery were only accessible by professionals. Courses were in English, except for one, in Spanish. The Donkey Academy was advertised throughout The Donkey Sanctuary website and Facebook page. During the first year, 1383 people enrolled, both The Donkey Sanctuary employees and external audiences. Majority of students were from UK (n=547, 49.95%), followed by USA (n=219, 20%) and Ireland (n=59, 5.39%). The European bases of The Donkey Sanctuary, Spain and Italy, enrolled 16 (1.46%) and 15 (1.37%) people, respectively. Majority of users are female (83.95%; n=905), aged 46-55 (n=296 27.33%); 19.43% work in animal care (n=178), while 13.32% are veterinarians (n=122). Possible limiting factors to the diffusion of The Donkey Academy include language barrier, inadequate advertisement, lack of IT accessibility, low informatics literacy. To expand the user base, translation of several courses in Italian, Spanish and French is ongoing. Moreover, seventy-five new courses are under-development, to be launched in 2023-24.

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References

1. Eadie, Edward N. Education for animal welfare. Vol. 10. Springer Science & Business Media, 2011.

Will the European Union introduce legislation to better protect the welfare of companion animals?

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Abstract: Societal importance given to the welfare of companion animals is increasing and with it, the request for a legal framework to protect their welfare (1). Currently, most European Union (EU) legislation on animal welfare covers farmed animals and animals used for scientific purposes, while few provisions cover companion animals. It is mostly left to Member States to legislate aspects companion animals welfare (2). Therefore, in 2018 a thematic group was set up under the EU Platform on Animal Welfare to provide guidelines and legislative recommendations to protect and improve the welfare of companion animals. This group, chaired by the Netherlands, was composed of representatives from 13 Member States, 3 NGO's, 1 veterinary organization, and 1 independent expert. The thematic group focused on 3 main areas around the welfare of dogs and cats: 1/ during transport, 2/ breeding and keeping, and 3/ sales and marketing. Guidelines and provisions for inclusion into EU legislation were prepared in all 3 areas (3). In autumn 2023, the EU is expected to publish 2 legislative proposals which could improve the welfare of companion animals, namely a proposal regarding the welfare of kept animals and a revision of the Transport Regulation (4,5). To conclude, the welfare of companion animals has up to now been neglected in EU legislation, but this could change soon. The preparatory work on what provisions could be included in new legislation has been done, which provides opportunities to better protect the welfare of companion animals at EU level.

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References

1. Sinclair, M., Lee, N., Hötzel M.J., et al., 2022. International perceptions of animals and the importance of their welfare. *Frontiers in Animal Science*. 3. <https://www.frontiersin.org/articles/10.3389/fanim.2022>.
2. Broom, D. 2017. Animal Welfare in the European Union. Study for PETI Committee of the European Parliament. [https://www.europarl.europa.eu/RegData/etudes/STUD/2017/583114/IPOL_STU\(2017\)583114_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2017/583114/IPOL_STU(2017)583114_EN.pdf) Accessed on 13 March 2023.
3. European Union. EU Platform on Animal Welfare. Voluntary initiative on the health and welfare of pets (dogs and cats) in trade. https://food.ec.europa.eu/animals/animal-welfare/eu-platform-animal-welfare/platform-conclusions_en#pets Accessed on 13 March 2023.
4. European Commission. Impact assessment for the revision of the EU animal welfare legislation. 12th meeting of the EU Platform on Animal Welfare. https://food.ec.europa.eu/system/files/2022-12/aw_platform_20221205_pres02.pdf Accessed on 13 March 2023.
5. European Union. Council Regulation (EC) No 1/2005 of 22 December 2004 on the protection of animals during transport and related operations and amending Directives 64/432/EEC and 93/119/EC and Regulation (EC) No 1255/97 (OJ L 3, 5.1.2005, pp. 1-44).

Teleworking with dogs: Dog-caregiver interaction and relationship strength matters for 'one welfare'

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Abstract: Since the COVID-19 pandemic, dog owning employees have been teleworking in the presence of their dog. Dogs may improve caregiver well-being on teleworking days [1] and telework may facilitate dog walking [2]. Yet, these benefits are likely dependent on daily dog-caregiver interactions [3] and the dog-caregiver relationship [4, 5]. This study aimed to investigate how the latter two factors moderate the daily impact of telework on dog caregiver quality of life (DOQoL) and affect. Such effects may determine caregivers' happiness with their dog and will likely contribute to dog well-being [6]. A sample of 256 Belgian teleworking dog caregivers responded to a baseline survey and to daily surveys during 10 consecutive workdays in the Spring of 2021 (Ndatapoints=1960). Trait measures included age, gender, partner, social support, emotionality and dog-caregiver relationship (M-DORS [7]). Daily measures included telework (0=office day; 1=teleworking day), dog-caregiver interactions, DOQoL and positive affect. Mixed coefficient modeling results showed two-way interactions between telework and dog-caregiver interactions—but not relationship strength—for both DOQoL and affect. Specifically, dog-caregiver interactions and relationship strength positively predicted DOQoL ($\gamma_{\text{interactions}}=0.28, p<.001$; $\gamma_{\text{relationship}}=0.44, p<.001$) and affect ($\gamma_{\text{interactions}}=0.10, p<.001$; $\gamma_{\text{relationship}}=0.10, p<0.05$). Yet, on teleworking days, more interactions were associated with lower DOQoL ($\gamma_{\text{teleworkingday*interactions}}=-0.02, p<.05$) and more positive affect ($\gamma_{\text{teleworkingday*interactions}}=0.03, p<.05$) compared to non-teleworking days. A three-way interaction between telework, interactions and relationship for affect indicated that a strong relationship amplified the affective benefits of interactions on teleworking days for caregivers ($\gamma_{\text{teleworkingday*interactions*relationship}}=0.03, p<.05$). Our study shows that dog-caregiver relationship strength directly adds to DOQoL and positive affect, and that it intensifies beneficial effects of dog-caregiver interactions during telework on caregivers' affect.

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References

1. Delanoëije, J.; Willemsen, E.; Verbruggen, M. Pet effect or garden effect? Effects of dog ownership and garden access on teleworkers' daily physical activity and loneliness in two seasons. Presented at the 30th International Society for Anthrozoology (ISAZ) Conference, Boise, Idaho, U.S.A., 7-9 July 2022.

2. Hoffman, C.L. The experience of teleworking with dogs and cats in the United States during COVID-19. *Animals* 2021, 11(2), Article 2.
3. Barcelos, A.M.; Kargas, N.; Maltby, J.; Hall, S.; Mills, D.S. A framework for understanding how activities associated with dog ownership relate to human well-being. *Scientific Reports* 2020, 10(1), 11363.
4. Payne, E.; Bennett, P.C.; McGreevy, P.D. Current perspectives on attachment and bonding in the dog–human dyad. *Psychology Research and Behavior Management* 2015, pp.71-79.
5. Bender, Y.; Bräuer, J.; Schweinberger, S.R. What makes a good dog-owner team? A systematic review about compatibility in personality and attachment. *Applied Animal Behaviour Science* 2023, 105857.
6. Mellor, D.J.; Beausoleil, N.J.; Littlewood, K.E.; McLean, A.N.; McGreevy, P.D.; Jones, B.; Wilkins, C. The 2020 five domains model: including human–animal interactions in assessments of animal welfare. *Animals* 2020, 10(10), Article 1870.
7. van Houtert, E.A.E.; Endenburg, N.; Wijnker, J.J.; Rodenburg, T.B.; van Lith, H.A.; Vermetten, E. The translation and validation of the Dutch Monash Dog–Owner Relationship Scale (MDORS). *Animals* 2019, 9(5), Article 5.

Behavioural evaluation of dangerous dogs as implemented in France: a survey among vet practitioners reveals need of framework

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Abstract: The behavioural evaluation (BE) of dangerous dogs is devoted to 2,964 veterinary evaluators in France. As no national training course is mandatory, their practices were surveyed online (nov.2017-jan.2018) to state if any recommendations of improvement might be formulated[1]. Responses to 12 questions the more appropriate to assess the BE practices were coded (0 to 4). Each respondent final score was compared to a reference score using a benchmarking process. The 607 respondents were representative (region: $\chi^2(13ddl)=9.86$; $p=0.71$), gender: $\chi^2(1ddl)=0.35$; $p=0.55$), age: $\chi^2(3ddl)=7.98$; $p=0.05$). They were mostly trained to undergo BE (>85% of them), also engaged in behavioural veterinary practice (about 50%). They trusted their BE (?8/10). They considered it as a good prevention tool to reduce dogs bite (60 to 85% according to dog's profile). BE should be implemented after any human bite (86%). Vets were considering the relevance of BE for any dog, whatever its breed (90%). A classification tree allowed to identify 7 predictive variables of good practices: getting the memoranda on the bite nature to assess the severity of a bite event; evaluating the dog in several contexts; number of BE conducted per year; recording of the BE in the national dedicated databank; type of training course followed if any; mean BE duration; thinking BE is a good prevention tool of danger risk. A good BE is hard to implement due to numerous bite emission factors and factors of exposure to a bite to take into account. A framework should be provided to conduct BE in a more systematised way.

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References

1. AVIS et RAPPORT de l'Anses relatif à l'évaluation du risque de morsure par les chiens. Oct. 2020. 230 pages. <https://www.anses.fr/fr/system/files/SABA2015SA0158Ra.pdf>

An insight of the good and bad of working as a search and rescue professional or dog-handler

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Abstract: This study explored the strength and weaknesses of rescue interventions perceived by Search and Rescue (SAR) professionals and SAR dog-handlers. A 60-item questionnaire was developed consisting of a Likert scale, ranking, and open-ended questions, and including a section (n=22 items) reserved for dog-handlers. The questionnaire was administered to 590 SAR workers, including 315 dog-handlers, operating in different European countries. For each question, Chi-square goodness of fit test was used to analyse the distribution of the answers while the relative importance of each answer was established based on its rank calculated by Friedman tests. Most respondents declared to be satisfied with their emergency management protocol (P<0.001), but about 40% of them complained of not receiving psychological support after a rescue intervention. Professional skills, good communication, and supplied tools were recognized as the most important factors for the success of rescue interventions (P<0.001). Most of the SAR dogs lived at home (84.6%), and the handler family contributes to their management (50.7%; P<0.001). Most responders considered that the dog-handler relationship [1] could improve their performance (n=169/295, 53%; p<0.001), as well as dog and personal training and more time available for these activities (P<0.001), but complained they SAR dog/handler' role is not highly valued within a rescue intervention (73.0%; P<0.001). In conclusion, SAR professionals recognize the importance of professional skills, tools, and proper organization, but some concerns emerged among dog handlers. The enhancement of their working role, psychological support, and training have room for improvement.

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References

1. Diverio S., Menchetti L., Riggio G., Azzari C., Iaboni M., Zasso R., Di Mari W., Santoro M., Dogs' coping styles and dog-handler relationships influence avalanche search team performance. *Applied Animal Behaviour Science*, 2017. 191:67-77.

Behavioral tests and study of the aptitudes of herding dogs (CANIDEA-IDELE project)

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Abstract: Introduction. Herding dogs are commonly used on French farms to facilitate the work of breeders. The training of a dog is facilitated if the dog spontaneously expresses behaviors in adequacy with the work expected. The goal of this project was to identify dogs with an "aptitude value (AV)", via behavioral tests (e.g. 1, 2, 3), to correlate behavioral and genetic data in order to better select dogs. Methodology. We developed an aptitude test with a scoring grid. The test was performed on a plot containing a batch of ewes, with a driver, approaching the flock. The test consisted of a 1 minute pre-test, aiming at excluding dogs showing 6 prohibitive behaviors. It was followed by a 2-minute test (16 behaviours related to the dog, 7 to the herd). Videos of the tests were analyzed by two observers, completed by field experts. Results. The tests were conducted for 188 dogs of various shepherd breeds, aged 8 to 24 months.

The tests of the first 96 dogs were analyzed: 27 dogs were classified as AV (39%). The most frequent causes of non-AV were: failure to surround or move the flock, no concentration, and biting. The Kappa coefficients were 1 [0.9-1] for repeatability and 0.95 [0.82-0.99] for reproducibility. The comparison of the classification between experts and observers showed a positive predictive value of 0.96, a negative predictive value of 1. Conclusion. These results aim at optimizing the selection of herding dogs, allowing a better human-dog communication, while ensuring the welfare of the dogs.

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References

1. Arvelius P., Malm S., Svartberg K., Strandberg E. (2013) Measuring herding behavior in Border collie—effect of protocol structure on usefulness for selection. *Journal of Veterinary Behavior* 8(1), 9-18.
2. Early J., Arnott E., Wade C.M., Mcgreevy P.D. (2014) Manual muster: A critical analysis of the use of common terms in Australian working dog manuals. *Journal of Veterinary Behavior* 9(6), 370-374.
3. Early J., Aalders J., Arnott E., Wade C., Mcgreevy P. (2020) Sequential Analysis of Livestock Herding Dog and Sheep Interactions. *Animals (Basel)* 10(2) 352-369.

Introducing two cats: love at first sight?

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Abstract: Cats in multi-cat households often experience social stress due to being forced to live with at least one other cat, which may threaten their welfare [1-2]. This study examined whether factors can be identified that play a role in developing a social bond between pet cats living together. An online survey in Flemish was launched for cat owners who had introduced a newly adopted cat to their resident cat in the previous 12 months. Information was collected about cat gender, age, personality, introduction method, housing environment and social bonding between the two cats. Data were analysed with a principal component analysis and a binomial logistic regression in SPSS. Based on 133 completed surveys, male cat pairs had significantly higher chance of forming a social bond than female pairs (OR = 15,78; p = 0,001). Concerning age, the older the resident cat, the lower the odds of social bonding with the new cat (OR = 1,29; p = 0,001). The odds were also lower when, the resident cat scored higher for personality components “aggressiveness” (OR = 2,32; p = 0,002) and “anxiety” (OR = 1,82; p = 0,026). Surprisingly, introduction method and housing environment were not significantly associated with developing a social bond. This study suggests that certain cat-related characteristics are associated with social bond formation, more specifically, gender, age and personality of the resident cat. This information may be useful for cat owners who consider adopting a second cat and for (veterinary) professionals advising cat owners.

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References

1. Stella, J.L., Lord, L.K., Buffington, C.A.T. Sickness behaviors in response to unusual external events in healthy cats and cats with feline interstitial cystitis. *J Am Vet Med Assoc* 2011, 238, 67-73.
2. Wassink-van der Schot, A.A., Day, C., Morton, J.M., Rand, J., Phillips, C.J.C. Risk factors for behavior problems in cats presented to an Australian companion animal behavior clinic. *J Vet Behav* 2016, 14, 34-40.

Equine air transportation practices and welfare issues: preliminary findings

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Abstract: Knowledge of equine welfare associated with air transport is scarce [1]. Animal-based measures and journey conditions were recorded prospectively from before departure to five days after arrival, documenting air transport practices and issues, and investigating possible associations. Data were collected from 94/547 horses on 27 journeys (duration 14±6 hours with up to 3 stops). Horses were young (7±4 years), including 14/43 mares that were pregnant. Before departure, most horses were quarantined (26±17 days). All were judged fit for transport and moved by road to the airport (231±207 Km). At the departure airport, seven horses arrived with minor injuries and 12 with nasal discharge; air temperatures varied from -6° to 33°C. Most horses, including the pregnant mares, were loaded in three-horse jet stalls. During the journeys, horses were watered every two to three hours and fed ad libitum. All but one ate (11±6 Kg/horse) and drank (17±12 L/horse). One was injured in transit. The average difference between air temperature inside the jet stall and the cargo hold was 5°C. On arrival, air temperature ranged from 2.5 to 28.5°C. Two horses were injured, two had diarrhoea and one fever; all recovered within five days. Nasal discharge developed in 37 horses; the likelihood of this increased when the departure airport temperature was lower (p<0.001) and the temperature variance between departure and arrival was greater (p<0.01). Our data provide evidence to evaluate horse welfare during air transport.

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References

1. EFSA Panel on Animal Health and Welfare (AHAW); Nielsen, S.S.; Alvarez, J.; Bicout, D.J.; Calistri, P.; Canali, E.; Drewe, J.A.; Garin-Bastuji, B.; Gonzales Rojas, J.L.; Gortázar Schmidt, C.; et al. Welfare of equidae during transport. EFSA J. 2022, 20, e07444.

Towards a good practice guide for breeding livestock guardian dogs

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Abstract: 1. Introduction Livestock guardian dogs are one of the main actors of pastoral systems in France, their presence bringing protection against predators for sheep flocks, but also issues linked to other mountain activities such as tourism (e.g. aggression problems). Given the lack of legislation about guardian dogs in France, the French Ministry of Agriculture has asked different actors to help improve breeding and use of dogs in the context of animal welfare respect. Beside legislation, the need of a national guide of good welfare practices is encouraged. 2. Discussion The aim was to highlight, with the help of experts and an online survey intended for users of guardian dogs, points at risk influencing dogs' welfare. We highlighted several critical points: 1) choices of breeders, 2) developmental conditions of puppies, in particular their interactions with humans, 3) dogs' living conditions (time spent alone with livestock, education practices, health and behavioral following), and 4) the end of life of older dogs. The 38 answers of the survey globally attested of respectful practices regarding animal welfare. 3. Principal conclusions We propose a list of possible solutions to ensure the welfare of guardian dogs in relation to the constraints of owners and use of the dogs. We highlighted the importance of breeding selection, education and living conditions of dogs. Based on this work, a guide for good practices would be useful to be edited and validated at the national level, in order to better ensure the welfare of these working dogs.

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Impact of social buffering on horse behaviour during commercial slaughter in the United Kingdom

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Abstract: In the limited research on equine welfare at slaughter, there are no studies exploring the impact of the presence of a conspecific during shooting. The aim of this project was to investigate whether horses exhibit different behaviour when shot in the presence of conspecifics versus shot alone. Closed-Circuit Television (CCTV) footage was analysed retrospectively, using an ethogram. Animal behaviour indicators and operator behaviour, level of restraint and shooting efficiency was assessed. Recordings from 256 equids were evaluated, with 12% (n=32) dispatched in pairs, of which 88% (n=28) were classified as semi-feral or unbroken horses, without restraint. The majority (94%, n=30) of co-shot horses showed affiliative behaviour towards each other. The median time for individually shot horses to spend in the kill pen was 20 seconds (range: 4-250s) and 60 seconds (range: 13-160s) for co-shot horses. There was no significant difference between those shot individually or co-shot for willingness to enter to the kill pen, response to the operator, or ear posture at time of shot. There was a significant difference in movement in pen ($p < 0.001$) and slipping ($p < 0.001$), with 13% (n=30) of individually shot horses seen to lose footing, yet none observed amongst co-shot horses. These findings suggest there may not be a significant difference in welfare when horses are shot individually or in pairs, although there may be a slight logistical and implied behavioural advantage to shooting semi-feral, or unrestrained, horses as a pair, to prevent slips or falls and limit significant movement in the pen.

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Let the owner staying with dogs during veterinary consultation

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Abstract: Many veterinarians ask themselves the following question: will the dog behave better with or without the presence of its owner? The owner can influence the behavior of his dog [1, 2], but how? Some veterinarians suggest that the owner remain present to facilitate the handling of a difficult dog; others ask the owner to come out. This question was even more present in people's mind during the COVID-19 pandemic [3], because habits changed, forcing owners not to bring their dog to the vet. It is known that dogs are stressed during veterinary consultation [1, 4-7] and recommendations have been proposed to limit stress during the veterinary consultation [1, 4], however, there is little scientific data allowing to answer this precise question [2, 7]. We therefore sought to focus on this subject with a study comparing two veterinary consultations: one with and one without the owner. Visits were standardized to be repeatable, and each dog-owner dyad followed the two conditions in a random order, 7 weeks apart. The consultations of 24 dogs were video-recorded to assess the stress of the dogs and the ease of handling of the dogs. The results showed that, although there were no significant differences in stress-related behaviours, behavioural analysis of the dogs suggested improved well-being in presence of the owner. Additionally, since the dogs' ease of handling was not significantly different between conditions, letting the owner attend the consultation seemed like the best option for a routine veterinary consultation.

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References

1. Lind, A.K., Hydbring-Sandberg, E., Forkman, B., Keeling, L.J. Assessing stress in dogs during a visit to the veterinary clinic: Correlations between dog behavior in standardized tests and assessments by veterinary staff and owners. *J Vet Behav* 2017, 17, 24-31.
2. Stellato, A.C., Dewey, C.E., Widowski, T.M., Niel, L. Evaluation of associations between owner presence and indicators of fear in dogs during routine veterinary examinations. *J Am Vet Med* 2020, 257, 1031-1040.
3. Quain, A., Mullan, S., McGreevy, P. D., Ward, M. P. Frequency, stressfulness and type of ethically challenging situations encountered by veterinary team members during the COVID-19 pandemic. *Front Vet Sci* 2021, 8, 647108.
4. Edwards, P.T., Smith, B.P., McArthur, M.L., Hazel, S.J. Fearful fido: Investigating dog experience in the veterinary context in an effort to reduce distress. *Appl Anim Behav Sci* 2019, 213, 14-25.
5. Mariti, C., Raspanti, E., Zilocchi, M., Carlone, B., Gazzano, A. The assessment of dog welfare in the waiting room of a veterinary clinic. *Anim Welf* 2015, 24, 299-305.
6. Döring, D., Roscher, A., Scheipl, F., Küchenhoff, H., Erhard, M.H. Fear-related behaviour of dogs in veterinary practice. *Vet J* 2009, 182, 38-43.
7. Csoltova, E., Martineau, M., Boissy, A., Gilbert, C. Behavioral and physiological reactions in dogs to a veterinary examination: Owner-dog interactions improve canine well-being. *Physiol Behav* 2017, 177, 270-281.

Good enough? Animal welfare on organic laying hen farms in Sweden

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Abstract: High animal welfare standards are fundamental in organic production. The aim of this study was to describe the welfare situation on Swedish organic laying hen farms in terms of housing, free-ranging, bird health and behaviour. Data collection on commercial farms (n=11) included farmer interviews, indoor and outdoor environment assessments, behavioural observations and clinical examinations (n=550). The median (min-max) flock size was 5750 (1118-17373) and farm size was 18000 (3000-120000). The median flock age was 74 (73-78) weeks. The median flock prevalence of moderate-severe plumage damage on the breast and belly, tail, and wings was 96 (84-100)%, 96 (72-100)% and 98 (94-100)%, respectively. The median flock prevalence of keel bone deviations, breast skin lesions and hyperkeratosis was 67 (32-84)%, 57 (10-74)% and 70 (38-100)%, respectively. The prevalence of severe hyperkeratosis was lower (p=0.003) in flocks housed on a thick layer of litter, in which more dust bathing events were also observed (p=0.007). The majority (95%) of the avoidance distance test trials were unsuccessful (i.e. the birds distanced themselves from the observer before the test could be completed). On seven farms, the free-ranges consisted mainly of pasture (80%). Of these, six had no or very little vegetation cover (5%). The hens were mainly observed ranging close to the house (20 m). The results show that important issues remain also in higher welfare systems and that, in order to increase poultry welfare in practice and not only in theory, the content of organic standards must transfer all the way to commercial farms.

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Are podcasts a useful tool to spread scientific knowledge about ethology to a broad audience?

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Abstract: 1. Introduction Podcasts are valued for their accessibility and combined educational and entertainment values. They are a readily available source of knowledge, and help change practices [1]. Some fields in medicine are represented more than others [2]. Podcast learning in human medicine is generally well perceived [3] and proved to be efficient in increasing patients' welfare [1]. 2. Discussion Podcasts could also be a useful tool in veterinary medicine, especially in behavioral medicine. Popular beliefs and misconceptions are often found in this discipline and can compromise animal welfare. To our knowledge, we are the first to launch a French-speaking podcast about behavioral medicine and animal welfare, based on ethological concepts. We launched the podcast on March 1st 2022, aiming at producing accessible knowledge to help people understand their pets with the help of the scientific literature. To this day, we published 51 episodes, with a total of 67 088 downloads (180 downloads/day). Episodes main subject is animal welfare, but fundamental notions in ethology are also addressed. Three episodes are critical reviews, eight are interviews, the others are discussions about various subjects between the two co-hosts. Five other veterinarians have been interviewed, including two ECAWBM specialists (one BM, one AWSEL). The most listened episode is one about "dominance", with 9.4 downloads/day since March, 4th 2022. 3. Principal conclusions Considering the number of downloads and the possibility of accessing a broad range of subjects, we make the statement that podcasts are useful to inform people about science, thus improving their pets' welfare.

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References

1. Little, Andrew, et al. "Podcasting in medicine: a review of the current content by specialty." *Cureus* 12.1 (2020).
2. Kelly, J. M., Perseghin, A., Dow, A. W., Trivedi, S. P., Rodman, A., & Berk, J. (2022). Learning through listening: A scoping review of podcast use in medical education. *Academic Medicine*, 97(7), 1079-1085.
3. Tabassum, F., Raza, F., Khan, F. A., Akbar, S. B., Bangash, S. R., & Shahid, M. (2019). Investigating the Impact of Podcast Learning in Health via Social Network Analysis. In *New Knowledge in Information Systems and Technologies: Volume 3* (pp. 493-499). Springer International Publishing.
4. Cai, F., McCabe, M., & Srinivas, S. K. (2023). A Randomized Trial Assessing the Impact of Educational Podcasts on Personal Control and Satisfaction During Childbirth. *American Journal of Obstetrics and Gynecology*. doi: 10.1016/j.ajog.2023.01.021.

BroilerNet - Practice and science broiler production innovation network

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Abstract: Poultry is expected to become the world's most widely consumed meat. The challenge for the European broiler sector is to provide safe and high-quality products that are affordable for consumers. Society demands for more sustainable production, more animal-friendly farms and ways of managing animal health that tackles key challenges, incl. antimicrobial resistance. Thus, significant adjustment of the broiler production is needed, which including a greater capacity of farmers to adapt day-to-day farming practices. Recently, it has become obvious that access to knowledge alone is not enough to generate innovation by farmers, and the ability of farmers to innovate was influenced by factors e.g. policies, and market forces. The Horizon Europe funded BroilerNet [1] aims to close this divide and to strengthening research and innovation in the broiler sector through an interactive approach to innovation. BroilerNet will create 12 national level innovation networks of broiler farmers and other actors to address challenges faced by the farmers in DE, EL; ES; FI; FR; IT, NL, PL PT, SE, SI and UK. Furthermore, three EU level networks will focus on three main topics: (1) environmental sustainability; (2) animal welfare; and (3) animal health management. Through a multi-actor approach, the most urgent needs of sector will be identified and the network will collect and evaluate good practices that can meet these needs. BroilerNet will engage with existing and new EIP-AGRI Operational Groups and enhance their impact. The selected best practices will be spread through dissemination activities to reach broiler farmers across Europe.

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References

1. <https://broilernet.eu/> accesses 2023-03-14

Quality of life and hair cortisol in dogs with chronic hepatic and intestinal diseases: a preliminary study

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Abstract: Chronic enteropathies (CEs) and chronic liver diseases (CLDs) are disorders characterized by persistent or recurrent chronic gastrointestinal signs [1]. This prospective study was aimed at comparing QoL, stress and anxiety levels, human-dog relationship and hair cortisol concentrations between dogs diagnosed with primary CE/CLD and healthy controls (C). QoL, stress and anxiety levels, C/DORS (Cat-/Dog-Owner Relationship Scale) [2] were collected through 1-10 scales completed by the owner. Hair cortisol was measured using EIA-kit [3]. Nineteen dogs were included in CE/CLD Group and 128 in C Group. In the CE/CLD Group, 8 dogs had CE and 11 dogs had CLD. According to severity, 13/19 dogs had irrelevant-mild clinical signs, whereas 6/19 dogs had a moderate-severe disease. Hair cortisol medians were 5.1(1.2-35.8) pg/mg in CE/CLD dogs vs 6.41(0.6-28.9) in C group, without a statistically significant difference (p=0.90); clinical severity neither resulted in statistically different hair cortisol (p=0.31).

CDORS, stress and anxiety levels did not differ between CE/CLD and C dogs ($p=0.45$, $p=0.25$ and $p=0.30$, respectively), neither they differ between CE/CLD dogs with irrelevant-mild vs moderate-severe signs ($p=0.42$, $p=0.89$ and $p=0.89$, respectively). QoL resulted significantly lower in CE/CLD dogs compared to healthy controls (7 vs. 9, $p=0.01$), but no differences according to severity ($p=0.39$). Chronic disease (but not its severity) was associated with a lower QoL, although neither stress/anxiety behaviors nor hair cortisol were found to be different compared to healthy dogs. Further investigation is needed to understand how QoL is assessed by owners and whether this provides relevant information for dog welfare.

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References

1. Allenspach K, Mochel JP. Current diagnostics for chronic enteropathies in dogs. *Vet Clin Pathol.* 2022 Feb;50 Suppl 1:18-28. doi: 10.1111/vcp.13068. Epub 2021 Oct 26. PMID: 34699081.
2. Riggio G, Piotti P, Diverio S, Borrelli C, Di Iacovo F, Gazzano A, Howell TJ, Pirrone F, Mariti C. The Dog-Owner Relationship: Refinement and Validation of the Italian C/DORS for Dog Owners and Correlation with the LAPS. *Animals (Basel).* 2021 Jul 22;11(8):2166. doi: 10.3390/ani11082166. PMID: 34438624; PMCID: PMC8388506.
3. Riggio G, Borrelli C, Campera M, Gazzano A, Mariti C. Physiological Indicators of Acute and Chronic Stress in Securely and Insecurely Attached Dogs Undergoing a Strange Situation Procedure (SSP): Preliminary Results. *Vet Sci.* 2022 Sep 23;9(10):519. doi: 10.3390/vetsci9100519. PMID: 36288132; PMCID: PMC9610408.

A new reversal learning test for horses

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Abstract: Learning difficulties may be linked to sleep disorders in horses, but so far, no practical test suitable for stable conditions has been available. We tested a novel reversal learning test (RLT) on 16 riding school horses. Before the RLT, horses were conditioned to touch an object presented individually from both sides and at different distances for median (CL95%) duration of 16.0 (16.8–19.6) min. During RLT, horses were required to reach a rate of 7 touches per minute, after which the target side was reversed until the test was over. The end criteria were that the treats were finished, the horse stopped working or 30 min had elapsed. Two days after RLT, we recorded the duration of REM-like-sleep (REMLS, resting neck relaxed) the horses performed in their stalls from 16 to 08. We scored it further as lasting either for less or at least 20 min (short or long REMLS). We tested with a log-rank test the possible differences in learning curves between short or long REMLS. Overall, 15/16 horses completed the test, with a median (CL95%) number of 6.0 (6.1–7.4) successful turns in 14.0 (12.4–14.6) min. However, the median number of successful turns was at 5 (3.9–6.1) for short REMSL and at 6 (4.3–7.7) for long REMSL ($\chi^2=6.4$, $p=0.01$). We concluded, that RLT can be performed under stable conditions. More studies are needed, but differences in test success may be explained by differences in sleep.

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The attribution of hostile intent may be linked to the endorsement of aversive stimuli in horse training

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Abstract: The biased attribution of hostile intent (AHI) to ambiguous behaviour of other humans is linked to antagonistic emotions and behaviours [1]. It is unknown if humans attribute hostile intent to ambiguous animal behaviour and if such attributions are linked to other variables such as attitudes and behaviour towards animals. Canadian and US equestrians were recruited through word of mouth, online publications and social media. Participants completed a three-part questionnaire consisting of a Word Sentence Association Paradigm [2] to assess AHI, questions to estimate endorsement of the use of aversive stimuli (EAS) in training, and demographic questions. Pearson's r was used to explore the relationship between AHI and EAS. ANOVA, followed by General Linear Modelling with post hoc Tukey was used to investigate the relationship between demographic variables and AHI/EAS. Data from 405 participants revealed that AHI was positively correlated to EAS ($r=.549$; $p<.001$). AHI was also associated with age ($p=.021$) and region of residence ($p=.006$). Both AHI and EAS were associated with level of equestrian training, equestrian discipline and equestrian cultural background (all $p<0.05$). University/college level training was associated with lower levels of AHI while Western equestrian disciplines such as rodeo and Western equestrian cultural background were linked to higher levels of AHI and EAS (all $p<0.05$). These results indicate that hostile attribution biases may also be relevant to human-horse interactions and that these biases appear to be linked to welfare-salient variables such as attitudes towards training. Recognising and investigating such biases may be important when devising programmes for human behaviour change.

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References

1. Klein Tunte, S., Bogaerts, S. and Veling, W. (2019). Hostile attribution bias and aggression in adults - a systematic review. *Aggression and Violent Behavior*, 46, pp. 66-81.
2. Dillon, K., Allan, N., Cogle, J. and Fincham, F. (2016). Measuring Hostile Interpretation Bias: The WSAP-Hostility Scale. *Assessment*, 23:6, pp. 707-719.

Is there a potential link between the gut-brain axis and feather-pecking behaviour of laying hens

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Abstract: Feather pecking (FP) is a behaviour performed by hundreds of millions of birds kept for egg-laying worldwide, leading to feather damage. FP is a unique behaviour since it is both an indicator and a cause of reduced welfare. Thus, there is an urgent need for a cure for FP behaviour. Ethologists consider FP to be a reflection of frustration arising from a lack of foraging/feeding behaviour. However, FP also occurs when birds are provided outdoor access, allowing them to express normal foraging/feeding behaviour. Therefore, this talk will summarize recent research results on understanding FP in laying hens linked to the gut- microbiome-brain connection. In humans, there is an overlap between behavioural/gut disorders, such as autism spectrum disorder, influenced by the gut microbiota and by 5-HT neurotransmission in the brain and gut. Similar associations were found in laying hens.

Indeed, it has been suggested that the avian serotonergic system and the amino acid precursor TRP are intimately linked to FP. Moreover, gastrointestinal symptoms, including the strong desire to eat feathers, altered intestinal motility, lower bacterial diversity and a decreased presence of Lactobacillaceae in feather peckers versus non-peckers were found. Interestingly, the administration of Lactobacillaceae as probiotics impacted the immune system via TRP metabolism. More specifically, it reduced indoleamine- pyrrole 2,3-dioxygenase activity and kynurenine concentration in laying hens. More importantly, Lactobacillaceae treatment prevented birds from pecking, probably via mechanisms impacting the TRP metabolism. To conclude, the field of research to better understand FP through a neurobiological gut-brain axis lens is rich with opportunities.

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Owner in veterinary consultation: keep a positive attitude and watch your dog

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Abstract: In human medicine, caregivers can reassure or, on the contrary, be stressful depending on their behaviour towards the person being cared for [1]. During a veterinary consultation, the question of the impact of the behaviour of the owner on his dog also arises. It is known that dogs synchronise their behaviour with that of their owner when confronted with an unknown situation [2, 3], so it can be assumed that this phenomenon can occur during a veterinary consultation. Two studies [4, 5] support the idea that verbal and physical interaction can calm the dog during a veterinary consultation. However, there is no information on the effect of owner stress on dog stress and the effect of the type of owner interactions on dog stress or tolerance to veterinary handling. We therefore sought to focus on this subject with 29 dog-owner dyads who had carried out a standardised and filmed veterinary consultation. Owner behaviour, dog behaviour and ease of dog handling were assessed via video. The results showed a link between dog and owner behaviours: when owners attended an exam, their negative behaviours intensified behavioural signs of anxiety in dogs. Additionally, visual and verbal attempts at reassurance were not sufficient to significantly soothe their pets. However, the more the dogs displayed stress-related behaviours, the more they made eye contact with their owners, suggesting that the dogs sought reassurance from their owners. We suggest that the eye contact of the owner with his dog makes it possible to appease him.

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References

1. Piira, T., Sugiura, T., Champion, G. D., Donnelly, N., & Cole, A. S. J. The role of parental presence in the context of children's medical procedures: a systematic review. *Child care health dev* 2005, 31(2), 233-243.
2. Merola, I., Prato-Previde, E., & Marshall-Pescini, S. Social referencing in dog-owner dyads? *Anim cogn* 2012, 15, 175-185.
3. Duranton, C., Bedossa, T., & Gaunet, F. When facing an unfamiliar person, pet dogs present social referencing based on their owners' direction of movement alone. *Anim Behav* 2016, 113, 147-156.
4. Csoltova, E., Martineau, M., Boissy, A., & Gilbert, C. Behavioral and physiological reactions in dogs to a veterinary examination: Owner-dog interactions improve canine well-being. *Physiol behav* 2017, 177, 270-281.
5. Stellato, A. C., Dewey, C. E., Widowski, T. M., & Niel, L. Evaluation of associations between owner presence and indicators of fear in dogs during routine veterinary examinations. *JAVMA* 2020, 257(10), 1031-1040.

Can we really have One (Animal) Welfare? Global variations in ethics and law in relation to painful procedures and unnecessary suffering in farmed animals

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Abstract: Despite extensive globalisation and increased connectedness between people, both physically and virtually, there are stark differences in minimum animal welfare standards across countries and cultures. Animal welfare was incorporated into the World Organisation for Animal Health (WOAH) themes of interest in 2001 [1]. However, the recommendations often lack the detail that the scientific evidence base currently provides us with. This is particularly true when considering the basic principle of avoidance of suffering. The introductory guidance (WOAH, 2019) [2] states: “Where painful procedures cannot be avoided, the resulting pain should be managed to the extent that available methods allow.” This allows for a wide interpretation of how a member country applies this recommendation to any legislation they develop. However, when we consider the socioeconomic status of countries, with 152 developing countries populated by 6.74 billion people (including Central & South America, Africa and most Asian countries), this comprises 85.43 percent of the world population (WorldData.info, 2023) [3]. A One Welfare Concept for a low-income country may be very different to one in a developed country. However, historical and cultural context are important when seeking to change attitudes towards practices that are regarded as societal norms. This is particularly true of farming practices in developed countries, where procedures may have been routinely carried out for decades, if not centuries, without any consideration for anaesthesia or pain relief, despite the knowledge that animals are sentient with the capacity to suffer. This presentation considers the challenges of setting harmonised global minimum animal welfare standards.

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References

1. WOAH (2019) Terrestrial Animal Health Code. Available online: <https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/> (accessed on 24th March 2023)
2. WOAH (2002) Terrestrial Animal Health Code; Chapter 7.1. Introduction to the recommendations for animal welfare, Available online: https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/?id=169&L=1&htmlfile=chaptre_aw_introduction.htm (accessed on 24th March 2023)
3. WorldData.info (2023) Developing Countries. Available online: <https://www.worlddata.info/developing-countries.php> (accessed on 24th March 2023)

Salt preferences of horses

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Abstract: Salt intake, but not preference has been measured in horses (Schryver et al., 1987). The two choice preference tests were conducted at a university research facility and were approved by the IACUC. The mares (mean age 16.7 ± 2.5; range 8-26) were kept in groups of 5 to 9 in grassless paddocks except for the old vs new salt blocks which was conducted while the horses were on pasture. A passive infrared camera was used to detect a horse licking each of the salt blocks which were positioned next to one another. Four types of blocks were tested: Plain white salt blocks, mineralized salt blocks, selenium blocks and Himalayan salt. There was no significant in the time spent licking one flavor of salt over the other. The horses visited Plain (10.4 ± 3.6 min) and Mineralized salt blocks equally (6.9 ± 1.3 min; $t = 0.93$ $P < 0.4$) and Plain (88.4 ± 30.1 min and Selenium (92.7 ± 16.6 min $P < 0.66$, $t < 0.65$) blocks equally and Mineralized (12.2 ± 2.7 and Selenium (9.7 ± 1.7; ($t = 1$; $P < 0.1$) equally. The time spent licking the salt block varied greatly between individuals. Seven of the 8 mares spent more minutes licking the Mineralized salt than the Selenium block, but the differences were small. There was a preference for old vs new salt blocks; 33% of the licks were to the new salt blocks. The conclusion is that horse will ingest salt with various minerals added and of various colors so that their nutritional welfare can be assured.

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References

Schryver, H. F., M. T. Parker, P. D. Daniluk, K. I. Pagan, J. Williams, L. V. Soderholm, and H. F. Hintz. 1987. Salt consumption and the effect of salt on mineral metabolism in horses. *The Cornell veterinarian* 77(2):122-131.

Measuring Paw Preferences in Dogs, Cats and Rats: Design Requirements and Innovations in Methodology

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Abstract: Brain asymmetries are common vertebrate features and are vital components of sensory, cognitive, and motor systems [1-2]. The study of behavioral lateralization in animals reveals crucial information about these systems and has been well-documented in a wide variety of species by using different techniques[3]. However, comparative laterality research faces challenges regarding reliability and validity that require new approaches and species-specific innovative designs to overcome. One of the main challenges in the field is that although validated tests exist for some species, there is still no standard test to compare motor laterality between individuals, populations, and animal species. One of the main reasons behind the need for a standardized test are each species' different fine motor abilities and body postures. During the talk, the design criteria necessary to establish a reliable food-reaching test as a standard measurement for paw preferences, considering the species-specific characteristics in cats, dogs, and rats, the most investigated species, will be discussed. Five novel species-specific food-reaching tests designed by the authors and evaluation data [4-5] will be presented. Emphasis will be put on design requirements such as zoometric fit for different body sizes and ages, reliability, the robustness of the material, and maintenance during and after testing. The solutions to these challenges will be provided and discussed in the broader context of laterality research, clinical neuroscience and animal welfare.

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References

1. Ströckens F, Güntürkün O, Ocklenburg S. Limb preferences in non-human vertebrates. *Laterality* 2013, 18, 536–575.
2. Güntürkün O, Ströckens F, Ocklenburg S. Brain lateralization: A comparative perspective. *Physiol Rev.* 2020, 100, 1019–1063.
3. Rogers LJ. Brain lateralization and cognitive capacity *Animals* 2021, 11.
4. Isparta S, Salgirli Demirbas Y, Bars Z, Cinar Kul B, Güntürkün O, Ocklenburg S, et al. The relationship between problem-solving ability and laterality in cats. *Behav Brain Res.* 2020, 391.
5. Salgirli Demirbas Y, Isparta S, Saral B, Keskin Y?lmaz N, Ad?ay D, Matsui H, et al. Acute and chronic stress alter behavioral laterality in dogs. *Sci Rep* 2023, 13, 4092.

A collaborative approach to pet air travel - one dog's journey

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Abstract: This case report describes the relocation of a 3-year-old, male entire Lagotto Romagnolo dog, who had been diagnosed with a generalized anxiety disorder 2 years prior and was being successfully managed via psychotropic medication, environmental management, and behaviour modification exercises, from Abu Dhabi, UAE to Melbourne, Australia. The collaboration between the pet owner, the GP veterinarian, a veterinary behaviour resident in the country of origin, a veterinary behaviour specialist in the country of arrival, a trainer, a pet shipping agent, a boarding facility in the country of origin and the quarantine station in the country of arrival ensured the dog's safe arrival to his new home in a state of good mental, emotional and physical health. The main contributing factors to the successful outcome of this air travel case were clear and frequent communication between all parties, the continuity of care, especially of the dog's emotional health, at all stages of the process and the implementation of a bespoke multi-modal stress management protocol for air travel [1]. A study investigating the physiological signs and behaviour of dogs during air transport concluded that air transportation is stressful for dogs [2]. An individual's air travel experience can be influenced by numerous factors and a collaborative approach between all parties involved in the preparation of the pet for air travel, the planning and execution of the journey itself as well as the care of the animal upon arrival, is required to safeguard the animal's welfare.

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References

1. Jahn, K.; DePorter, T. Feline stress management during air travel: a multimodal approach. *Journal of Feline Medicine and Surgery* 2023, 25(1), 1-16
2. Bergeron, R. et al. Physiology and behavior of dogs during air transport. *Canadian Journal of Veterinary Research* 2002, 66(3), 211-216.

How do pets cope with air travel?

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Abstract: According to the US DOT (Department of Transportation) Air Travel Consumer Report which includes "incidents involving the loss, injury or death of animals during air transportation" in 2022, there were 7 deaths and 5 injuries [1]. Considering 2 million pets and other live animals are transported by air every year in the United States alone [2] and anecdotal reports of problems for pets during air travel are common, it seems probable that injury, suffering, and even animal death as a result of air travel are under-reported. This abstract will outline current issues impacting pet air travel, including the following: Discussion points: • Complexities of the pet air travel industry and how different organisations are involved with and influence animal travel. • Unaddressed fear, anxiety, and distress. • Unmedicated or undermedicated animals - negative historical experiences with tranquilisers such as acepromazine [3] have negatively influenced the use of anxiolytics. • High-risk pet populations such as brachycephalic breeds with high BOAS (brachycephalic obstructive airway syndrome) scores. • Management of "aggressive" pets. • "Unowned" pets that are transported to other countries for resale. • Companion animals being falsely presented as emotional support- or service animals by owners concerned about the risk of air travel. Animal well-being during air travel requires many steps long before the day of the flight: the preparation, execution, and arrival of the pet at the destination need to be considered by all parties involved in the pet's air travel journey [4].

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References

1. Air travel consumer reports for 2022. US Department of Transportation. Available online: <https://www.transportation.gov/individuals/aviation-consumer-protection/air-travel-consumer-reports-2022> (accessed on 8 March 2023).
2. Plane Talk: Traveling with Animals. US Department of Transportation. Available online: <https://www.transportation.gov/airconsumer/plane-talk-traveling-animals> (accessed on 8 March 2023).
3. Tennyson, A. Air transport of sedated pets may be fatal. *JAVMA* 1995, 207(6), 684.
4. Jahn, K.; DePorter, T. Feline stress management during air travel: a multimodal approach. *Journal of Feline Medicine and Surgery* 2023, 25(1), 1-1.

Impulse control aggression in a female labrador: it's not cured by medication alone!

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Abstract: An intact 12-month-old Labrador Retriever presented to a veterinary behaviour specialist. The dog was polyphagic, was aggressive when challenged by the male owner and was fed a raw food diet. A physical examination and bloodtests revealed hypocholesterolemia, hypoglobulinaemia and an elevated T4-level. The raw food diet was stopped and basic behaviour advice was given. An abdominal ultrasound scan and ACTH test were negative. The dog was diagnosed with impulse-control aggression. Medical treatment was initially refused. The aggression worsened and the owners opted for medical treatment resulting in initial behaviour improvement. Nevertheless, the male owner continued to confront the dog in challenging situations. Eventually the dog was picked up by Animal Control and caught with a catching pole. The dog was kept at the veterinary hospital overnight. The owners were warned about treatment compliance and how the welfare of the dog was being compromised. In case the owners can't manage the dog, rehoming ought to be considered. The owners requested further diagnostics including a specialist neurological consultation and a MRI. No further abnormalities were revealed and the owners vowed to work hard on the management of the dog. The behaviour worsened as the dog was again repeatedly challenged. The dog's breeder took the dog in, deliberately provoked her and subsequently advised euthanasia. The dog was recovered. The owners then vowed to follow the treatment-plan to the letter and the dog went on to do very well. This case highlights the importance of behaviour management when dealing with cases of impulse-control-aggression.

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One welfare Parallels between Veterinary and Human Forensic Medicine: detainment, interviewing & charging murder suspects vs dogs detained under suspicion of causing grievous harm

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Abstract: Clinical human forensic medicine dictates that suspects arrested and detained on the suspicion of murder must be presumed innocent until proven guilty, well cared for whilst detained, fit to be interviewed and fit to be charged (Stark 2020). Relevant parallels may be drawn between the capture, care and assessment of dogs that are taken into custody on suspicion of having caused physical harm to a person or another non-human animal, yet guidelines are notably lacking. This poses a colossal animal welfare concern as dogs are sentient beings, leads to ethical debate and is a subject which clearly needs addressing (ESVCE 2022). The need for human detainees to be presumed innocent until proven guilty is vital as the very allegation of having committed murder can provoke bias. Similarly detained dogs are routinely referred to, and treated, as “dangerous dogs”, with identical risk of bias. Experts trying to safeguard the welfare of these dogs refuse to refer to them as such, preferring terms such as “dogs of law” (ESVCE 2022, Sweeney 2014). Experts in the field of dog bites call for a multidisciplinary approach to the care and assessment of dogs that have bitten (Shepherd, 2017). In this light, we use elements proposed by Stark (2020) as a framework to highlight the parallels between the two fields of human and veterinary forensic medicine, provide guidance as to how dogs in custody should be assessed in particular, and identify areas where further research is warranted to safeguard the welfare of these dogs.

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References

1. ESVCE 2022. ESVCE working group: Dogs of Law. <https://esvce.org/esvce/esvce-working-groups> Homepage on the internet. Last accessed 8 April 2022.
2. Shepherd, K, 2017. The assessment of dogs for legal cases – a UK perspective. In: Mills, D.S. and Westgarth, C. Dog bites: a multidisciplinary perspective, 5m Books Ltd.
3. Stark, MM. and Rix KJB. Chapter 11 Fitness to be Interview and Fitness to be charged. In Stark MM. (2020) Editor. Clinical Forensic Medicine. A Physician’s Guide. Fourth edition. Springer Nature Switzerland.
4. Sweeney N. 2014. Dogs of Law.

Straight from the horse's mouth: Salivary oxytocin and cortisol changes in horses after interactions with unfamiliar humans

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Abstract: More research on human-horse interactions is needed from both a safety and a welfare perspective [1], especially since horses are increasingly used for equine- assisted interventions [2]. Oxytocin (OT) and cortisol (CORT) are potential welfare indicators due to their role in social behaviour [3] and stress responses [4] respectively, so far little research has been conducted on salivary OT and CORT during interactions between horses and unfamiliar humans. This study aims to investigate changes in salivary OT and CORT in 18 horses (9 geldings and 9 mares; mean age=16 years) during 10 minutes of standardized human-horse interactions. The horses were split into two groups based on the median of behavioural parameters, i.e. if showing either relatively low or high rates of a certain behaviour. Results demonstrate that relative changes in OT tended ($p=0.063$) to be larger in horses ($n=9$) that spend longer time in proximity to the unfamiliar human, compared to horses ($n=9$) that spend shorter time in proximity to the unfamiliar human. Relative changes in CORT are significantly larger ($p=0.046$) in horses ($n=7$) that show high rates of chewing, compared to horses ($n=11$) that show low rates of chewing. These findings indicate that OT and CORT changes in saliva can reflect aspects of human-horse interactions. Further research with a larger population is needed to substantiate and validate whether horses perceive interactions with (unfamiliar) humans as positive. Based on literature [5] and the cortisol changes observed in this study, chewing might be a behavioural indicator of stress in horses.

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References

1. Hausberger, M., Roche, H., Henry, S., Visser, E.K., 2008, A review of the human-horse relationship. *Applied Animal Behaviour Science* 109: 1-24. DOI: 10.1016/j.applanim.2007.04.015
2. Boss, L., Branson, S., Hagan, H., Krause- Parello, C., 2019, A Systematic Review of Equine-Assisted Interventions in Military Veterans Diagnosed with PTSD. *Journal of Veterans Studies* 5 (1):23-33. DOI: 10.21061/jvs.v5i1.134
3. Ishak, W.W., Kahloon, M., Fakhry, H., 2011, Oxytocin role in enhancing well-being: A literature review. *Journal of affective disorders* 130: 1-9. DOI: 10.1016/j.jad.2010.06.001
4. Hellhammer, D.H., Wüst, S., Kudielka, B.M., 2009, Salivary cortisol as a biomarker in stress research. *Psychoneuroendocrinology* 34:163-171.
5. Torcivia, C., & McDonnell, S. (2021). Equine Discomfort Ethogram. *Animals*, 11(2), 580. DOI: 10.3390/ani11020580

An evaluation of the walk training apprentice guide and assistance dogs receive and its influence on their behaviour and success

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Abstract: The Irish Guide Dogs for the Blind are committed to helping visually impaired people and children with autism. Their apprentice dogs take part in rigorous training programmes. However, not every dog graduates (23% withdrawn). Since walk training is a significant aspect of training programmes and an opportunity for dogs to spend one-on-one time with their trainers, the quality and duration of walks could have an impact on their success. This project aims to understand how physical activity influences the behaviour of apprentice dogs and their success. This is being assessed using: (1) Assistance Dog Test Battery (ADTB), and (2) Canine Activity Monitor (AM). The ADTB is conducted at week 3 (Data Collection (DC) 1) and 10 (DC2) of the training programme. AM starts at DC1 and ends at DC2. As of March 2023, N=43 dogs have participated, 22 males and 21 females. Average age at DC1 was 15.4 months (std.1.6) and DC2 was 17.1 months (std. 1.7). Breeds include Labrador retrievers (LR), Golden retrievers (GR), LRxGR, and a Poodle. N=11 have a defined training outcome. Initial results show dogs withdrawn for behaviour (N=2) spent less time walking daily than successful dogs. However, with a testing period 15 days shorter than average and only 27% of walks during this time being tracked, a more complete dataset is required before any statistical analysis is completed. Preliminary results indicate there is great potential in using canine activity monitors to gain insight into walk training with the possibility of creating more efficient training programmes.

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Identification of behaviours related to social separation in the domestic cat

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Abstract: Cats may develop strong emotional attachment with their owners and, thus, can display separation-related behaviours (SRB) in case of the physical or visual absence of them [1, 2]. Several different behavioural manifestations have been suggested as signs of SRB in cats although their conceptual relationship with one another is not clearly stated. This study aimed to investigate whether the SRBs reported in the literature represent the same construct as hypothesized. An online survey was directed to cat owners (Nparticipants=114; Ncats=133) to evaluate the frequency of traditional SRBs on a 5- point Likert Scale. A Principal Component Analysis (PCA) was performed to assess whether the specified behavioural elements loaded on the same component. As a result of PCA, four distinct components were found: (1) behavioural responses upon the departure cues, (2) negative responses towards inaccessibility, (3) elimination problems and (4) destructive behaviour and self-harm after the departure. Behavioural responses, which had formerly been reported to be displayed in the same context [3], were represented under different categories in this study. One may suggest that traditional identifiers of SRB in cats can be manifestations of different emotional regulators rather than a single, separation-

related emotional state. Moreover, behaviours displayed upon the departure cues can be used as risk factors for developing SRB in cats. Future studies using multi-measure ways would be helpful to improve the accuracy of diagnostic tools for SRB in cats.

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References

1. Schwartz, S. (2002). Separation anxiety syndrome in cats: 136 cases (1991-2000). *Journal of the American Veterinary Medical Association*, 220(7), 1028-1033. <https://doi.org/10.2460/javma.2002.220.1028>.
2. de Souza Machado, D., Oliveira, P. M. B., Machado, J. C., Ceballos, M. C., & Sant'Anna, A. C. (2020). Identification of separation-related problems in domestic cats: A questionnaire survey. *PloS one*, 15(4), e0230999. <https://doi.org/10.1371/journal.pone.0230999>.
3. Calder, C. D. (2019). Animal behavior case of the month. *Journal of the American Veterinary Medical Association*, 254(6), 676-679.

Owner opinion survey on the question of the housing conditions and welfare of horses

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Abstract: Objectives Horse management aims to keep horses healthy and ensure animal welfare. Many horses are currently kept in individual boxes, their free movement and social interaction is limited. (Connysson et al., 2019). Recognizing pain in nonhuman animals and empathy toward them is important for modulating human-animal relationships and animal welfare. (Daniela et al., 2019) Our objectives were to find associations between horse welfare, owner's background and proprietary knowledge. Materials & Methods We used a Google Forms based questionnaire which is shared on social media platforms. The current number of completed answers received is 277, but the goal is to reach 500. Results The majority of the respondents are women with higher education and good financial conditions, which suggests that it is not a financial problem or a lack of perception that may indicate poor keeping conditions. 70% of the owners are hobby riders, with a strong emotional attachment to their horses. 30 % keep their horses alone. This data is correlated to that only 70% think that the lack of contact with peers can be an issue of animal welfare. We asked further questions about the recognition of pain and behavior disorders. Half of the respondents want to improve their horse's current conditions and 91% of them expect the necessary help and information from the veterinarian. Conclusion Based on our findings, we may conclude that prevention is more effective if we use targeted informative instructions in a suitable form of communication with an authentic summary of veterinary literature.

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References

- Connysson, M., Rhodin, M. Jansson, A. (2019) Effects of Horse Housing System on Energy Balance during Post-Exercise. *Recovery Animals (Basel)*, 9(11): 976, DOI:10.3390/ani9110976
- Daniela, L., Vázquez, R., Tadich, T. (2019) Exploring the Relationship between Socio-Demographic Background and Empathy toward Nonhuman Animals in Working Horse Caretakers. *Society and Animals*, 29(5-6):1-20, DOI:10.1163/15685306-12341607

Separation anxiety is associated with high caregiver burden for dog owners

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Abstract: Ninety privately-owned dogs diagnosed with separation anxiety from four European countries (Finland, Poland, Netherlands, Germany) participated in a clinical study. One aspect of this study was to collect data on how separation anxiety affects the quality of life of the caregivers. Caregiver burden was assessed by responding to questions related to changes required due to dog's diagnosis, feelings arising from the situation, effects on the relationship with the dog and considerations related to the human-animal bond. Dog owners were also asked about their overall impression of the level of burden related to dog's separation anxiety using a 4-point scale (not burdensome, slightly burdensome, burdensome, very burdensome). Majority of the owners reported that dog's separation anxiety had caused changes to their daily activities (77.6%) or to their home (65.1%). More than half reported that separation anxiety caused more household chores (56.2%) and limited time they had to themselves (51.7%). Many owners felt guilty for not doing more for their dog (34.8%) and 16.9% noted negative effects to their relationship. Quarter felt that they could no longer care for their dog (25.8%), and some had been considering giving their dog away (19.1%) or even having it euthanised (6.7%). In the overall caregiver burden assessment 65.2% of the owners rated the level of burden related to dog's separation anxiety as high ('burdensome' or 'very burdensome'). Separation anxiety is not only stressful to the dog but also negatively affects the quality of life of the owner, thus presents a threat to the human-animal bond.

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Investigating PTSD-like behaviours in domestic pet dogs following unexpected aversive acoustic stimuli: a case series

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Abstract: Signalment and presentation An Australian Shepherd dog (3 years) and a mixed breed dog (2 years) were presented at Ghent University for emerging problematic behaviour that started since a delineated traumatic event, namely unexpected, aversive, acoustic stimuli. Behavioural history Prior to the traumatic event, one dog was deemed sensitive, but neither dog exhibited abnormal behaviour. Both dogs underwent profound behavioural alterations following exposure to sudden, loud, and aversive auditory stimuli. Medical history and physical examination Medical histories of both dogs were unremarkable. Blood analysis was conducted on one dog and demonstrated normal results, while results for the other dog were unavailable. Comprehensive clinical examinations on both dogs revealed no discernible abnormalities. Behavioural examination A thorough behavioural analysis of both dogs showed progression of abnormal behaviour. Initially, anxiety was associated with traumatic triggers but eventually became generalized and anticipatory. Both dogs exhibited avoidance behaviour regarding stimuli that evoked memories of the traumatic event. Additionally, there were other distinct behavioural changes observed in each dog. Diagnosis Based on the examination and the history of a traumatic event, a probable diagnosis of canine Post-Traumatic Stress Disorder (c-PTSD) could be made. A brain scan revealed increased regional cerebral blood flow in subcortical areas, including the thalamus and the basal ganglia, which was reported to be associated with PTSD in mice [1]. Conclusion This case series illustrates that c-PTSD may present with similar externalizations but can also display considerable individuality in manifestation in dogs. This emphasizes the need for clarity regarding the diagnosis of c-PTSD.

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References

1. Xi, K.; Xiao, H.; Huang, X.; Yuan, Z.; Liu, M.; Mao, H.; Liu, H.; Ma, G.; Cheng, Z.; Xie, Y.; Liu, Y.; Feng, D.; Wang, W.; Guo, B.; Wu, S. Reversal of Hyperactive Higher-Order Thalamus Attenuates Defensiveness in a Mouse Model of PTSD. *Sci Adv* 2023, 9 (5), eade5987. <https://doi.org/10.1126/SCIADV.ADE5987>.

Interspecific behavioural synchronization: how owner-stranger interactions affect dogs' behaviours toward the stranger

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Abstract: Dogs synchronize their behaviours with their owner but not with strangers [1-4], and adjust their behavioural response with their owner's when meeting an unknown person (social referencing [5-7]). We investigated whether the interactions between owners and an unknown person facilitated the dogs' behavioural synchronization with the unknown person. We compared two experimental groups of adult pet dogs: an experimenter unknown to the dogs, either walked and talked with the owner for 15 minutes for the first group (n = 16) or stayed away from the owner for 15 minutes for the second group (n = 16). We then compared the dogs' behavioural synchronization with the experimenter during a straight-line walk using Global Positioning System (GPS) devices and video recordings. Linear Mixed Models results show that the first group of dogs stayed closer ($p < 0.001$) and had a speed closer to the experimenter's at the beginning of the straight-line walk ($p = 0.028$) than the second group of dogs. We also found that dogs of both experimental groups were attracted to their owner: they tended to move away from the experimenter to get closer to the owner during the straight-line walk ($p < 0.001$). These results reveal the existence of motor contagion of walk [8] at the interspecific level, supporting the hypothesis of an interspecific motor resonance induced after a 15-minute side-by-side walk with the owner. They also highlight the closeness of the dog-owner bond and the importance for strangers to establish contact with owners before interacting with unfamiliar dogs.

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References

1. Duranton, C.; Bedossa, T.; Gaunet, F. Interspecific Behavioural Synchronization: Dogs Exhibit Locomotor Synchrony with Humans. *Sci. Rep.* 2017, 7(1), 12384.
2. Duranton, C.; Bedossa, T.; Gaunet, F. Pet Dogs Synchronize their Walking Pace with that of their Owners in Open Outdoor Areas. *Anim. Cognit.* 2018, 21(2), 219-226.
3. Lamontagne, A.; Legou, T.; Rauchbauer, B.; Grosbras, M.-H.; Fabre, F.; Gaunet, F. Behavioural Synchronization and Social Referencing of Dogs and Humans: Walking in Dyad vs in Group. *Anim. Cognit.* 2023.
4. Duranton, C.; Bedossa, T.; Gaunet, F. When Walking in an Outside Area, Shelter Dogs (*Canis familiaris*) Synchronize Activity with their Caregivers but do not Remain as Close to Them as Do Pet Dogs. *J. Comp. Psychol.* 2019, 133(3), 397-405.
5. Duranton, C.; Bedossa, T.; Gaunet, F. When Facing an Unfamiliar Person, Pet Dogs Present Social Referencing Based on their Owners' Direction of Movement Alone. *Anim. Behav.* 2016, 113, 147-156.
6. Merola, I.; Prato-Previde, E.; Marshall-Pescini, S. Social Referencing in Dog-Owner Dyads? *Anim. Cognit.* 2012, 15(2), 175-185.
7. Merola, I.; Prato-Previde, E.; Marshall-Pescini, S. Dogs' Social Referencing towards Owners and Strangers. *PLoS ONE.* 2012, 7(10), e47653.
8. Blakemore, S.-J.; Frith, C. The Role of Motor Contagion in the Prediction of Action. *Neuropsychol.* 2005, 43(2), 260-267.

Case study on cryptorchidism in a horse from a medico-legal and animal welfare viewpoint

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Abstract: Cryptorchidism is the incomplete descent of one or both testicles into the scrotum, usually a hereditary and unilateral condition [1, 2]. In the equine male, testes descent starts 30 days before birth and ends 10 days after. Although documentation is limited, it has been reported that retained inguinal testicles take up to 2 or 3 years of age to enter the scrotum in horses [3]. Before purchasing, it is good practice to have the horse undergo a veterinary examination in order to identify possible diseases or defects. Authors report a case study of cryptorchidism and discuss some medico-legal and animal welfare issues. One year after purchase, a 2-year-old American Quarter Horse stallion was diagnosed with a retained right testicle in the abdomen, necessitating a unilateral laparoscopic standing cryptorchidectomy. From a medico-legal viewpoint, cryptorchidism is a defect if: i) it exists before purchase or has pre-existing causes at the time of sale (i.e., genetic predisposition); ii) it is hidden (sometimes asymptomatic); iii) it is severe or chronic. Furthermore, cryptorchidism must be treated surgically because of the risk of testicular torsion, neoplastic transformation, reduced reproductive efficiency with a serious impact on animal welfare. In conclusion, knowledge of this case study should guide equine practitioners to be familiar with the issues arising in courts regarding horse purchase so that they can play an active role in the changing trends in veterinary law and medicine. Since we cannot exclude genetic predisposition, the horse should not be used for reproduction, even if it might be fertile.

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References

1. Edwards, J.F. Pathologic conditions of the stallion reproductive tract. *Animal Reproduction Science* 2008, 107(3-4), 197-207.
2. Snider, T.A. Reproductive Disorders in Horses. *Veterinary Clinics of North America: Equine Practice* 2005, 31(2), 389-405.
3. Leipold, H.W.; DeBowews, R.M.; Bennett, S. Cryptorchidism in the horse: Genetic implications. In *Proceedings of the Annual Convention of the American Association of the Equine Practitioners*, Nashville, TN, USA, 29 November-3 December 1986; pp. 579-89.

Waiting rooms are stressful - the effect of being in a veterinary waiting room on dogs' fear, anxiety, and stress levels

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Abstract: This study investigated whether healthy dogs that waited in a veterinary waiting room had higher fear, anxiety, and stress (FAS) levels when entering the consultation room, compared to dogs that waited in a car. Dogs and owners were randomly assigned to the two treatments (N waiting room=18, car=19). The dog and owner waited approximately 5 minutes in their respective locations before the dog was weighed and then entered one of two consultation rooms. Six phases were executed in the evaluation of the dogs' FAS level. There was a significantly higher FAS score (p-value = 0.009) for the dogs in the waiting room treatment. The inter-rater reliability between the examiner and a blind evaluator, when evaluating the dogs on the FAS scale, was strong (Cohens Kappa= 0.82). The results support the hypothesis, that veterinary waiting rooms may be a stressful place for dogs to wait. However, we also found that owners of waiting room dogs had a higher stress level than did owners of car dogs, and that more of the waiting room dogs were evaluated in the smaller of the two consultation rooms. Possible implications of this will be discussed. The dogs' sex and neuter status, previous bad experiences or their reaction to the weight did not have a significant influence on their FAS score. Our results add to a growing pool of scientific evidence that may be used to optimize the veterinary practice towards reducing fear, anxiety, and stress in dogs.

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Concurrent use of tasipimidine and fluoxetine

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Abstract: The objective of the study was to evaluate pharmacokinetics of tasipimidine alone and in combination with fluoxetine, and to study effects of the combination on functional alertness and cardiovascular parameters (blood pressure (BP), heart rate (HR) and ECG) in dogs equipped with telemetry devices. The study was performed in 2 Phases. In Phase 1, dogs received a single dose of 20 µg/kg (4 dogs) and 30 µg/kg (4 dogs) of tasipimidine before the assessments. In Phase 2 all dogs were dosed once daily with fluoxetine 1 mg/kg for 12 days. Assessments were done on day 10 (fluoxetine alone) and after a single dose of tasipimidine with doses 20 µg/kg (4 dogs) and 30 µg/kg (4 dogs) on days 1 and 12. The study treatments were given by a treatment administrator and the clinical assessments were conducted by a blinded assessor. Dogs' alertness was slightly reduced by combination of tasipimidine at the dose of 30 µg/kg with fluoxetine, but not when tasipimidine dose was reduced to 20 µg/kg in the combination. Tasipimidine alone and in combination with fluoxetine was well tolerated and safe in respect to cardiovascular effects (BP, HR and ECG) in healthy dogs. The exposure of tasipimidine was increased and maximum plasma concentration was reached faster when tasipimidine was given after repeated dosing of fluoxetine. Slower absorption of fluoxetine was observed when dosed concomitantly with tasipimidine. The effect on functional alertness supports the use of lower dose of tasipimidine (20 µg/kg) when combined with fluoxetine 1 mg/kg.

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The ethics of body donation in veterinary species

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Abstract: The use of animal bodies in initial and continuing veterinary education is widely accepted [1], but ethical considerations regarding how to obtain and use these bodies are often lacking [2]. In this context, following a deontological approach, I want to argue that the use of animal bodies should be guided by principles similar to those regulating the collection of human bodies for scientific purposes. In humans, the use of unclaimed bodies from unknown provenance, criminals, homeless persons or grave robbing is no longer happening in most countries [3]. Accordingly, body donation programs has been emphasized to be the only acceptable source of bodies [4, 5]. I argue that it should also be the case for veterinary species, contrary to the current practices of using animals from shelters or breeding [2]. These programs should include, among other things, consent from the owners, the absence of commercial purposes, and the respect for all parties involved in the process [3-6]. After obtaining the body, it should be treated with the utmost care and respect, following best clinical practices based on the current state of evidence. Transparency and respect for the family's choices seem to also be paramount. Overall, the importance of maintaining a kind of dignity towards the animal's body in all circumstances should be the primary ethical guide for practitioners and students [7]. By applying these principles, we can better ensure that the use of animal bodies in education and training is conducted in a respectful and responsible fashion.

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References

1. Martinsen, S.; Jukes, N. Towards a Humane Veterinary Education. *Journal of Veterinary Medical Education* 2005, 32, 454–460, doi:10.3138/jvme.32.4.454.
2. Kumar, A.M.; Murtaugh, R.; Brown, D.; Ballas, T.; Clancy, E.; Patronek, G. Client Donation Program for Acquiring Dogs and Cats to Teach Veterinary Gross Anatomy. *Journal of Veterinary Medical Education* 2001, 28, 73–77, doi:10.3138/jvme.28.2.73.
3. Riederer, B.M. Body Donations Today and Tomorrow: What Is Best Practice and Why?: Body Donations Today and Tomorrow. *Clinical Anatomy* 2016, 29, 11–18, doi:10.1002/ca.22641.
4. Ghosh, S.K. The Practice of Ethics in the Context of Human Dissection: Setting Standards for Future Physicians. *Annals of Anatomy* 2020, 232, 11, doi:10.1016/j.aanat.2020.151577.
5. Jones, D.G. Searching for Good Practice Recommendations on Body Donation across Diverse Cultures: Good Practice Recommendations. *Clinical Anatomy* 2016, 29, 55–59, doi:10.1002/ca.22648.
6. Ashall, V.; Millar, K.M.; Hobson-West, P. Informed Consent in Veterinary Medicine: Ethical Implications for the Profession and the Animal 'Patient.' *Food Ethics* 2018, 1, 247–258, doi:10.1007/s41055-017-0016-2.
7. Winkelmann, A. Consent and Consensus-Ethical Perspectives on Obtaining Bodies for Anatomical Dissection: Consent and Consensus. *Clinical Anatomy* 2016, 29, 70–77, doi:10.1002/ca.22651.

Effect of human-animal relationship quality on linear and nonlinear parameters of heart rate variability in pigs

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Abstract: Heart rate variability (HRV) is a proxy measure of the autonomic function that is commonly used as a noninvasive physiological indicator of swine stress [1-3]. We evaluated the effect of human-animal relationship quality on linear and nonlinear parameters of HRV in pigs during a human interaction test. Thirty-six 21-day-old female pigs were randomly assigned to one of three treatments (4 pens/treatment). Positive human handling (PHH; n=12 pigs): animals received long-term gentle tactile contact. Negative human handling (NHH; n=12 pigs): animals subjected to long-term chronic intermittent stress through exposure to different acute handling stressors. Control group (CG; n=12 pigs): animals exposed to minimal handling. Both PHH and NHH were applied for 2 min/pig, twice/day, five days/week for seven weeks (days 16-61). On days 66-69, all animals were individually tested in an open-field test for 7 min while confronted by the handler. Cardiac activity during the interaction was recorded using a Polar V800 heart rate monitor. Linear (SDNN, RMSSD, HF, LF) and nonlinear (DFA¹, SampEn) HRV parameters [3] were quantified using Kubios Software. Data were analyzed using linear models in R.4.1.2. PHH pigs had higher RMSSD values (p=0.004) and RMSSD/SDNN ratio (p=0.0008), compared to NHH and CG, indicating higher parasympathetic activity. NHH pigs exhibited a higher LF/HF ratio compared to PHH (p=0.01) and CG (p=0.03). SampEn was lower in NHH than in PHH pigs (p=0.03), indicating increased physiological stress. Our results indicated reduced physiological stress for PHH pigs, while NHH pigs increased their stress response when interacting with humans during the test.

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References

1. Von Borell, E.; Langbein, J.; Després, G.; Hansen, S.; Leterrier, C.; Marchant-Forde, J.; ... & Veissier, I. Heart rate variability as a measure of autonomic regulation of cardiac activity for assessing stress and welfare in farm animals—A review. *Physiol. Behav.* 2007, 92, 293–316.
2. Luna, D.; González, C.; Byrd, C. J.; Palomo, R.; Huenul, E.; Figueroa, J. Do domestic pigs acquire a positive perception of humans through observational social learning?. *Animals* 2021, 11, 127.
3. Byrd, C. J.; Johnson, J. S.; Radcliffe, J. S.; Craig, B. A.; Eicher, S. D.; Lay, D. C. Nonlinear analysis of heart rate variability for evaluating the growing pig stress response to an acute heat episode. *Animal* 2020, 14, 379–387.

“Why can’t I kick your dog?” - An exercise to teach ethical theories to veterinary and life sciences students

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Abstract: In the veterinary field, the study of ethics is particularly important due to the complex ethical issues that arise in research, clinical practice, and industry. However, traditional methods of teaching ethical theories can be dry or detached from students’ moral intuitions, leading to disengagement from the subject matter [1]. Case-based learning can make the teaching of ethical theories more engaging and meaningful and there is a long tradition of using case studies to impart both animal and veterinary ethics [2, 3]. These approaches, however, require at least some philosophical background knowledge. This is particularly challenging for students with no previous ethics training. This presentation describes a workable and meaningful method to introduce students to animal ethics theories drawing from 15 years of experience in teaching ethics to life science students. The method involves an individual reflective exercise that generates a word-cloud, a tutored group discussion, and a post-teaching ethical profiling exercise, using the Animal Ethics Dilemma web tool [4]. Up to nine distinctive ethical theories have been identified from students’ initial responses: animal rights, deontology, utilitarianism, ecocentrism, biocentrism, virtue ethics, feminist ethics, hedonism, and contractarianism. These theories are then explained within the group, thus framing students’ moral intuitions against established animal ethics frameworks. The post-teaching independent exercise allows students to build their personal ethical profile, and appraise the complexity of moral decisions involving animals. In summary, by providing a real-world example, the suggested method can be an effective tool for encouraging the application of different ethical theories and fostering dialogue and reflection among students.

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References

1. Cowley C. The dangers of medical ethics. *Journal of Medical Ethics*. 2005 Dec 1;31(12):739–42.
2. Rollin B.E. *An Introduction to Veterinary Medical Ethics: Theory and Cases*. 2nd Edition edition. Ames, Iowa: Wiley-Blackwell; 2006. 332 p.
3. Fawcett A., Mullan S. *Veterinary Ethics - Navigating Tough Cases* [Internet]. Sheffield, UK: 5m Publishing; 2017 [cited 2017 Mar 31]. 552 p. Available from: <http://www.5mbooks.com/veterinary-ethics-navigating-tough-cases-1885.html>
4. Hanlon A., Algers A., Dich T., Hansen T., Løor H., Sandøe P. ‘Animal Ethics Dilemma’: an interactive learning tool for university and professional training. *Animal Welfare*. 2007 May 1;16(2):155–8.

Adaptation response in sheep: the extreme phenotypes of cortisol levels reveal different expression patterns of salivary miRNAs

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Abstract: Farm procedures impact on animal welfare by activating the hypothalamic- pituitary-adrenal axis (HPA). The physiological adaptation response is individual and reflects genetic and experiences affecting epigenetic factors [1, 2]. MiRNAs are noncoding RNA molecules involved in homeostasis, recently identified as potential biomarkers of stress and resilience [3]. We aim to define the salivary miRNAs profiles associated with variable adaptation-responses in sheep. Saliva from twenty Frabosana-Roaschina ewes (10-12 months old) was collected 3 times before (PRE) and 3 times after (POST) introducing a ram in the flock. Ewes LOW (N=4) and HIGH (N=4) were defined from cortisol, analysed with ELISA assay. MiRNAs of ewes that showed the same phenotype in both collections (PRE- POST) were analysed with RT-qPCR. MiR-16b, miR-21, miR-24, miR-26a, miR-27a, miR-99a and miR-223 were analysed among 17 circulating-miRNAs selected according to literature and their expression compared between the two phenotypes with Mann-Whitney U test. The HIGH ewes were characterized by a lower expression of miR-99a in PRE, while miR-16b and miR-21 expression was lower in POST samples ($p < 0.05$). Additional analysis will be performed to check association between miRNAs and cortisol phenotypes and, if present, to evaluate their possible predictive values. Finally, miR-16b, -21 and -99a were associated to different cortisol phenotypes. In humans, acute psychological social stress induces changes in miR-21 and miR-16 profiles [4]. Mir-16 is involved in serotonin transporter gene regulation and correlated with the individual perception of stressors. Due to high homology among species, salivary miRNAs might be used for genetic selection of ewes to identify resilient individuals.

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References

1. Cockrem, J.F. Individual Variation in Glucocorticoid Stress Responses in Animals. *Gen. Comp. Endocrinol.* 2013, 181, 45–58.
2. Pant, S.D.; You, Q.; Schenkel, L.C.; Voort, G.V.; Schenkel, F.S.; Wilton, J.; Cain, L.; Karrow, N.A. A Genome-Wide Association Study to Identify Chromosomal Regions Influencing Ovine Cortisol Response. *Livest. Sci.* 2016, 187, 40–47.
3. Shandilya, U.K.; Sharma, A.; Naylor, D.; Canovas, A.; Mallard, B.; Karrow, N.A. Expression Profile of miRNA from High, Middle, and Low Stress-Responding Sheep during Bacterial Endotoxin Challenge. *Animals* 2023, 13, 508.
4. Wiegand, C.; Heusser, P.; Klinger, C.; Cysarz, D.; Büssing, A.; Ostermann, T.; Savelsbergh, A. Stress- associated changes in salivary microRNAs can be detected in response to the Trier Social Stress Test: An exploratory study *Sci. Rep.* 2018, 8, 7112.

Effects of the nebulisation of Lavender Essential Oil on the behaviour, skin and tail lesions of growing pigs

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Abstract: Lavender (*Lavandula angustifolia*) Essential Oil (LEO) is a calming phytoextract that could be administered by inhalation to pigs to reduce anxiety/aggression and improve animal welfare [1-3]. This trial tested its effects on some welfare indicators during the growing phase. Fifty-six crossbred barrows (44kg BW) with undocked tails were allotted to two experimental groups, each including 4 pens of 7 pigs. In the LEO group room, a 1% solution of lavender oil was vaporized for 10min twice a day. The trial lasted 63 days. Individual behaviour, body weight, skin and tail lesions were assessed at three timepoints (beginning, middle and end of the trial). Data were submitted to ANOVA using the group as the main effect. For severity classes distribution of tail lesions, the Chi-squared test was used. No difference emerged between groups in growth parameters. The overall level of activity was not affected by the experimental group (recumbency occupied 56.7 vs. 58.2% of the day in CON vs. LEO, respectively, $P>0.05$). Total overall number of body lesions was significantly reduced in LEO compared to CON (6.6 vs. 9.3, $P=0.002$) as well as the severity of tail lesions (76 vs. 53% of intact tails, 19 vs. 39% of mild damages and 6 vs. 8% of severe damages, $P=0.007$). Although the positive effects of LEO nebulisation were not strong enough to modify the overall behaviour, a decrease in animals' aggressiveness and tail/skin damage was recorded over the long period. However, further trials are recommended under farm conditions and on larger animal numbers.

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References

1. Batiha, G.E.S.; Teibo, J.O.; Wasef, L.; Shaheen, H.M.; Akomolafe, P.; Teibo, T.K.A.; Al-kuraishy, H.M.; Al-Garbeeb, A.I.; Alexiou, A.; Papadakis, M. A review of the bioactive components and pharmacological properties of *Lavandula* species. *Naunyn-Schmiedeberg's Arch Pharmacol* 2023, <https://doi.org/10.1007/s00210-023-02392-x>
2. Bradshaw, R., Marchant, J., Meredith, M.; Broom, D. Effects of lavender straw on stress and travel sickness in pigs. *J Altern Complement Med* 1998, 4, 271-275.
3. Direksin, K.; Nopwinyoowong, S.; Seesupa, S. Influence of lavender essential oil inhalation on aggressive behavior of weaned pigs. *J Appl Anim Sci* 2017, 10, 47-56.

What does the British public want for farmed animals in the UK? The human- farm animal bond expressed through survey data

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Abstract: For farmed animals, the human animal bond in any nation is expressed through survey data. This presentation is a case study on British public opinion, based on a 2023 published report [1]. What are British public beliefs and attitudes to farmed animal welfare? Is British public opinion consistent with animal welfare science? And should Government policy be influenced by public attitudes to welfare? The British public supports high animal welfare standards. For instance, a 2022 Focaldata poll found 71% of the British public would like the UK Government to pass more laws to improve welfare [2]. The British public supports more extensive and outdoor systems, and is opposed to cages and mutilations. A 2020 YouGov poll found 88% of the British public believe cages for farmed animals to be cruel, and 77% support a complete ban [3]. Despite this, over 70% of farmed animals in the UK are raised intensively [4]. Contemporary intensive farming systems are associated with significant welfare problems. Over 25% of broiler chickens suffer lameness due to rapid growth [5]. Almost all the UK's indoor breeding sows are severely confined in crates for five weeks per litter [6]. Around 30% of the UK laying flock is kept in modified cages, with the mutilation of beak trimming prevalent [7]. All governments have a guardianship role to protect farm animal welfare [8]. Furthermore, given European publics are both citizens and consumers, there are strong democratic and market-based reasons for government policies to reflect public opinion on farmed animal welfare.

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References

1. McCulloch, S. Farm Animal Welfare in the UK: What Does the British Public Want?; Conservative Animal Welfare Foundation: UK, 2023.
2. Focaldata. Animal Welfare Standards; 2022.
3. Compassion in World Farming. 88% of UK public think cages are cruel. Available online: <https://www.ciwf.org.uk/news/2020/12/88-of-uk-public-think-cages-are-cruel> (accessed on February 8).
4. Compassion in World Farming. UK factory farming map. Available online: <https://www.ciwf.org.uk/factory-farm-map/> (accessed on February 14).
5. RSPCA. Eat. Sit. Suffer. Repeat: The Life of a Typical Meat Chicken; Royal Society for the Prevention of Cruelty to Animals: 2020.
6. McCulloch, S. Banning Farrowing Crates in the UK: Transitioning to Free Farrowing to Meet the Welfare Needs of Pigs; Conservative Animal Welfare Foundation: UK, 2022.
7. Gov.UK. UK egg packing station throughput and price dataset; DEFRA: 2023.
8. Farm Animal Welfare Council. Farm animal welfare in Great Britain: Past, present and future; Farm Animal Welfare Council: London, 2009.

To hug or not to hug? How body language and nonverbal cues are key to clarity in human-canine communication

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Abstract: Humans express feelings of love/affection/care verbally/demonstratively via touching/holding/carrying/feeding/kissing/leaning into each other. However, human behaviours targeting dogs, expressing love/affection, may cause stress in dogs, elicit calming signals, or even defensive/fearful/aggressive behaviour (e.g., bites/snapping). In the current study, two authors searched (02/23) video-sharing platforms/google using four strings “man/woman/child/* hugging dog video”. The cut-off was set on the 80 most popular videos (7/YouTube, 4/Facebook, 4/Instagram, 5/TikTok, 60/blogs; range 5-106/sec./video, showing “hugging” between humans (49/adults, 19/children, 12/infants; 34/male, 46/female) and dogs (18/dogs < 30cm, 19/dogs 30-45cm, 43/dogs > 45cm). Human behaviours targeting dogs, included: staring into the dogs’ eyes (28.75%), touching/stroking the dogs’ back/head/body with hand (98.75%), embracing/holding the dog with body/arms (91.25%), carrying the dog (17.5%), putting face against the dog’s face (58.75%), kissing the dog (25%), or grabbing and squeezing the dog’s throat with hand (26.25%). Most frequently shown dog behaviours to humans when hugged were; turning their head/looking away (69.75%), licking their nose/lip (43.75%), licking/hugger (21.25%), ears back (60%), blinking (81.25%), panting (42.5%), biting (7.5%). This study revealed several welfare concerns. Dogs’ stress/negative behaviours may occur due to a miscommunication/misunderstanding as dogs do not show affection/desire for social contact by staring into a conspecific’s eyes or placing paws on paws/back/bodies. Alternatively dogs, like humans, react differently dependent on their bond with the person initiating the hug and/or the behavioural sequence of which this hug is part. Also in human-human communication studies, positive and negative or violent reactions to hugging are described in different contexts. It may be that the same (non)verbal cues/behaviours can elicit these miscommunication/misunderstanding and outcomes in both human-dog and human-human contacts.

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Guidelines and legal frameworks for canine-assisted interventions in EU countries

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Abstract: Over the past 20 years, canine-assisted interventions (CAIs) have become popular programs in which dogs are involved in diverse settings to facilitate/augment/catalyze predetermined needs of individuals during therapy/activities/or learning [1]. This study aims to identify the policies and practices influencing the implementation of CAIs focusing on EU countries. Peer-reviewed and gray literature were searched by two authors (02/23) using an array of databases, including Medline, Pubmed, Scopus, Web of Science, Google Scholar, and a targeted Google search for relevant European Guidelines and had no time limits. Two proposals targetting CAI (Sweden, Belgium) [2, 3] and three countries (Italy/Germany/Austria) [4, 5, 6, 7] which have legislative frame-works describing minimum health/welfare/selection/training criteria for CAI dogs and compulsory training for CAI practitioners were identified. In countries where no specific laws/regulations apply to dogs in CAIs, the national and/or municipal animal protection/welfare legislation applies. Facilities appear not to have developed/implemented core policies; rather, there seems to be a reliance on CAI providers to ensure resident safety. Findings show that in EU countries, there is a shortage of legislation which may lead to situations in which dogs, often out of safety considerations, might be refused access to public places (clinics/schools/prisons/care facilities) where they can work. Additionally, unsuitable/untrained/un-socialised/non-health-screened animals with possible behavioural/health issues have been reported to interact with humans with compromised immunity or behavioural problems, causing a risk to dogs/clients' health/welfare [1]. More clarity/regulation is needed to guarantee best practices for CAI projects.

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References

1. Meers LL, Contalbrigo L, Stevens VA, Ulitina OM, Laufer SJ, Samuels WE. The state of animal-assisted interventions: COVID-19 safety protocols and ethical considerations. *J Appl Anim Eth Res.* 2021, 1, 1-23. doi: 10.1163/25889567-BJA10019
2. Lerner, H. A proposal for a comprehensive human–animal approach of evaluation for animal-assisted interventions. *International Journal of Environmental Research and Public Health*, 2019, 16(22), 4305.
3. Van der Vloet, T., Jans, V; Vande Ryde M., De Martelaert, A. Vandenhove, L. Voorstel van resolutie: over nieuwe beleidsimpulsen van assistentiehonden. Ingediend 2/2/2023. 1567 – Nr1.
4. Italian Ministry of Health Italian National Guidelines for Animal Assisted Interventions (AAI). Agreement Between the Italian Government, the Regions and the Autonomous Provinces of Trento and Bolzano. 2015. Available online at: http://www.salute.gov.it/imgs/C_17_opuscoliPoster_276_allegato.pdf (accessed February 1, 2023).
5. Simonato M, De Santis M, Contalbrigo L, Benedetti D, Finocchi Mahne E, Santucci VO, et al. Farina L. The Italian agreement between the government and the regional authorities: national guidelines for AAI and institutional context. *Peop Anim Int J Res Pract.*, 2018 1:1–11.
6. Informationen über Therapiebegleithunde. 2015. Available online at: <https://www.vetmeduni.ac.at/de/therapiebegleithunde/informationen-ueber-therapiebegleithunde> (accessed February 1, 2023).
7. Tierschutzgesetz - § 11 TierSchG. 2006. Available online at: <https://tierschutzgesetz.net/paragraph-11> (accessed February 1, 2023).

The PNEI (psychoneuroendocrinoimmunology) approach in animal clinical ethology: dancing from body cross-talking to an integrated therapy

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Néthos

Abstract: In the last ten years, the PNEI (psychoneuroendocrineimmunology) approach has made relevant contributions to the fields of human neuroscience, psychobiology, molecular biology, and clinical research [1]. PNEI highlights the effect of stress on human health and highpointing the close interrelations between psyche, brain, microglia and neuroimmune systems¹. Recently, PNEI approaches have started to be described in holistic animal behavioural medicine [2]. Where the chronic stress modifies the physiological crosstalk between the brain and the different biological systems, through a sympathetic/parasympathetic nervous response in proinflammatory or anti-inflammatory processes [3]. Moreover, the immune system is one of the three major integrative systems in mammals, with a close relationship between the endocrine and nervous systems⁴. The sympathetic chronic stimulation with neuroinflammation reproduces an inflammatory response of the central nervous system [5], mediated by cytokines, chemokines, and other messages produced by the immune cells, modulated by microglia activation [4]. Indeed, microglia are emerging as critical regulators of neuronal function and behavior in nearly every area of neuroscience [4]. As example, this model is well described in aging dogs with chronic gut dysbiosis, developing a cognitive and emotional decline like human, correlated to chronic neuroinflammation [6]. Differences between pathological (inflammation) and adaptive (parainflammation) functions of neuro-immune interactions are necessary to recognise prodromal signs in altered cognitive-emotional disorders in a PNEI animal model [2]. Modern clinical ethology would study the stress and the psyche-brain-immune network to promote integrated therapies in animal behavioural disorders.

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References

1. Bottaccioli, A.G.; Bottaccioli F.; Minelli, A. Stress and the psyche-brain-immune network in psychiatric diseases based on psychoneuroendocrineimmunology: a concise review. *Neuroimmunomodulation in Health and Disease*. Ann. N.Y. Acad. Sci. 2020 ISSN 0077-8923 pp 1-8.
2. Mengoli M. Animal psiconeuroendocrinoimmunology, an example of integrated therapy presented at the Ab-MeVeC II International Congress. Rio de Janeiro, Brasil, 18-19 November 2022.
3. Pongratz G.; Straub R.H. The sympathetic nervous response in inflammation. *Arthritis Res Ther*. 2014. 16(6):504.
4. Woodburn, S.C.; Bollinger J.L.; Wohleb ES. The semantics of microglia activation: neuroinflammation, homeostasis, and stress. *J Neuroinflammation*. 2021. 18(1):258. doi: 10.1186/s12974-021-02309-6. PMID: 34742308; PMCID: PMC8571840
5. Di Sabato D.J., Quan N., Godbout J.P. Neuroinflammation: the devil is in the details, *J Neurochem*. 2016. 139 Suppl 2, 136–153.
6. Ambrosini Y.M.; Borcharding D.; Kanthasamy A.; Kim H.J.; Willette A.A.; Jergens A; Allenspach, K.; Mochel J.P. (2019) The Gut-Brain Axis in Neurodegenerative Diseases and Relevance of the Canine Model: A Review. *Front. Aging Neurosci*. 2019. 11:130.

The phenomenon of animal hoarding and its effects on the behavior of a sample of cats housed at municipal shelter of Milan

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Abstract: The “Animal hoarding” phenomenon occurs when an individual, the hoarder, owns too many animals and cannot adequately provide management and care for them, resulting in the form of mistreatment [1]. The literature investigating the behavior of victims involved in animal hoarding is limited [2, 3, 4] and most studies focus on dog [5, 6, 7, 8, 9] and very few on cat [10]. The present work aims to assess the repercussions of hoarding mistreatment on feline behavior through a prospective pilot study. The behaviors of 26 cats, animal hoarding victims (case group), and 49 cats, non-animal hoarding victims (control group), hosted at the municipal shelter of Milan were collected through direct observation. A data collection form was used to register the general information about cats (such as breed, age, and sex), their postures and behaviors. Descriptive statistics were calculated, and T-test was used to investigate possible differences between groups. Cats in the case group often exhibited arched back, tails close to the body or lowered, and tremors ($p < 0.05$). Case group cats showed mydriasis and whisker forward and licked their lips more frequently than subjects in the control group ($p < 0.05$). Control group cats purred more frequently than the cases ($p < 0.05$). The case group showed more freezing, hiding/isolating, and escape attempts ($p < 0.05$). This study seems to indicate an effect of mistreatment due to hoarding on the behavior of cats: however, being a pilot work, further studies are needed to confirm and extend our results.

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References

1. American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders, Fifth Edition (DSM-5). Washington DC: American Psychiatric Publishing.
2. Calvo, P., Duarte, C., Bowen, J., Bulbena, A., Fatjó, J. (2014). Characteristics of 24 cases of animal hoarding in Spain. *Animal Welfare*, 23(2), 199–208.
3. Arnold, S., Mackensen, H., Ofensberger, E., Rusche, B. (2018). Assessment of Recent Cases of Animal Hoarding in Germany: The Challenge for Animal Shelters and Public Authorities. 1(1), 10.
4. Joffe, M., O’Shannessy, D., Dhand, N., Westman, M. and Fawcett, A. (2014). Characteristics of persons convicted for offences relating to animal hoarding in New South Wales. *Aust Vet J*, 92, 369–375
5. McMillan, F. D., Vanderstichel, R., Stryhn, H., Yu, J., Serpell, J. A. (2016). Behavioural characteristics of dogs removed from hoarding situations. *Applied Animal Behaviour Science*, 178, 69–79.
6. d’Angelo, D., Ciani, F., Zaccherini, A., Tafuri, S., Avallone, L., d’Ingeo, S., Quaranta, A. (2020). Human- Animal Relationship Dysfunction: A Case Study of Animal Hoarding in Italy. *Animals*, 10(9), 1501.
7. Reid, P. J. (2013). Animal behaviour forensics: evaluation of dangerous dogs and cruelty victims. In: Miller, L., Zawistowski, S. (Eds.), *Shelter Medicine for Veterinarians and Staff*, second ed. Wiley- Blackwell, Ames, Iowa, pp. 559–567.
8. McMillan, F. D., Duffy, D. L., Zawistowski, S. L., Serpell, J. A. (2015). Behavioral and psychological characteristics of canine victims of abuse. *J. Appl. Anim. Welf. Sci.*, 18, 92–111.
9. Trocmé, N., Fallon, B., MacLaurin, B., Sinha, V., Black, T., Fast, E., Holroyd, J. (2008). Canadian Incidence Study of Reported Child Abuse and Neglect.
10. Jacobson, L. S., Ellis, J. J., Janke, K. J., Giacinti, J. A., Robertson, J. V. (2022). Behavior and adoptability of hoarded cats admitted to an animal shelter. *Journal of Feline Medicine and Surgery*, 24(8), e232–e243.

“Nobody really knows what you’ve done wrong”: A qualitative study of Norwegian turkey farmers’ perceptions about footpad dermatitis and how to manage it

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Abstract: Footpad dermatitis (FPD) is a common and painful welfare problem in commercially grown turkeys [1]. Wet litter is the main risk factor, the cause of which may be multifactorial, including high stocking density, litter type, diet, and gut health. The Norwegian turkey industry is small, comprising 44 farms. There are legislative limits to stocking density [2], but if FPD score at slaughter is above a certain limit, the stocking density for the next flock must be further reduced. The aim of this study was to gain knowledge about Norwegian turkey farmers’ perceptions regarding FPD, and how this is managed at farm level, by the industry, animal welfare authorities, and legislators. We adopted a qualitative methodology based on institutional ethnography [3], emphasising what people do, say, and know about their practice, as expert knowers and doers. Nine turkey farmers were recruited and interviewed in Zoom, using an open-ended interview guide. The informants perceive FPD to be the most significant welfare issue. They experience that they receive little advice, and that interventions may fail. The informants expressed frustration over being “punished” by having to reduce the stocking density for a problem with no clear solution: “If you get a high footpad score you might be punished, but nobody really knows what you’ve done wrong.” The study indicates that there may be either knowledge gaps or a lack of successful knowledge transfer regarding FPD in turkeys, and that some welfare issues may be inherently difficult for farmers to manage in conventional turkey production.

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References

1. Weber Wyneken C.A., Sinclair A., Veldkamp T., Vinco L.J., Hocking P.M. (2015). Footpad dermatitis and pain assessment in turkey poulters using analgesia and objective gait analysis. *British Poultry Science*, 56: 522–530, <http://dx.doi.org/10.1080/00071668.2015.1077203>
2. Norwegian Ministry of Agriculture and Food. (2001) FOR-2001-12-12-1494, forskrift om hold av høns og kalkun, <https://lovdata.no/dokument/SF/forskrift/2001-12-12-1494> (in Norwegian).
3. Smith, D. E. (Ed.). (2006). *Institutional ethnography as practice*. Rowman & Littlefield.

Prevalence of behavioural problems in rescued sighthounds rehomed in Italy

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Abstract: Behavioural problems are among the most cited causes of dog relinquishment or of returning a dog to a shelter after adoption (Protopopova and Gunter, 2017). They can also negatively affect the human-animal relationship and the welfare of both the person and the dog, even when the dog is retained (Protopopova and Gunter, 2017). We investigated the prevalence of some possible behavioural problems in 250 rescued sighthounds (157 females, 93 males) rehomed in Italy using a dedicated online questionnaire. The most often reported behavioural issues were predatory behaviour toward cats (45.2%), predatory behaviour toward other animals (34.3%) and fear of loud noises, (fireworks, thunderstorms), which did not appear to be proportional to the actual noise level (30.9%). Shadowing the owner (28.5%), fear of unfamiliar adult people (23.4%), coprophagia (21.6%) and absence of recall (20.4%) were also reported in at least a fifth of the dogs. Among the least represented issues (<1% of dogs) were: aggressive behaviour toward familiar adult people and toward both familiar and unfamiliar children (all 0.4%). It is important for prospective adopters and rescue organisations to be aware of the most frequent vulnerabilities these dogs may show, in order to promote responsible adoptions, good matching, and plan possible preventive interventions, in a one-welfare perspective.

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References

Protopopova, A., Gunter, T. M., 2017. Adoption and relinquishment interventions at the animal shelter: a review. *Anim. Welfare* 26: 35-48.

Animal therapeutic neglect: when does it mean animal abuse?

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Abstract: Although based on increasing recognition, the protection of companion animal welfare still suffers from poor legal implementation and enforcement, in Italy. Animal keepers should ensure necessary veterinary/health care as recognized by an agreement between the central Government and the Regions [1]. However, veterinarians have often reported that owners refuse life-saving treatments (or even recommended euthanasia) to their animals for economic reasons, not necessarily linked to a real lack of funding [2,3]. In some cases, situations like these have led to judicial decisions referring to lack of veterinary care to crimes such as animal abandonment or mistreatment/abuse [4]. These situations entail an ethical conflict between animal wellbeing and human autonomy and a legal one between considering animals as “res”/things (articles 810 and 1496 of the Civil Code)[5] and recognising their status as sentient beings [6]. Even if the latter can prevail thanks to article 13 of the Treaty of Lisbon, the reformed article 9 of the Constitution, articles 544 bis ff. and 727 of the Penal Code [7], it is complex to define when and to what extent veterinary therapy is mandatory, and scarcity of funds can be considered as a legal exemption. A strict duty of care needs to be discussed because of the risk of unfairness towards pet owners belonging to disadvantaged social categories. Further research on veterinary therapeutic neglect is needed to define the responsibilities involved and delineate appropriate responses from a legal, ethical and deontological perspective improving political and administrative initiatives to manage and reduce this phenomenon.

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References

1. Accordo tra il Ministero della Salute, le Regioni e le Province autonome di Trento e di Bolzano in materia di benessere degli animali da compagnia e pet-therapy del 06 febbraio 2003 (GU Serie Generale n.51 del 03-03-2003).
2. Meers L.L., Walsh E., Ulitina O., Pereira J., da Graça Pereira G., Salgirli Demirbas Y., Begum S., Platto S., Pollastri I., de Mori B., Normando S. 2022. Impact of COVID-19 lockdowns on companion animal welfare. 31st International Society for Anthrozoology Conference - ISAZ 2022 - "Anthrozoology in translation: communicating research to and from multiple audiences" – Boise ID 7-9 July 2022. Proceedings p. 135.
3. Walsh E., Meers L., De Mori B., Platto S., Pereira J., Ferreira P., Da Graça Pereira G., Salgirli Demirbas Y., Begum S., Pollastri I., Ulitina O., Normando S., 2022. Moral distress in companion animal veterinarians: a comparison between Belgium, China, Ireland, Italy, Portugal, and Turkey - 4th annual meeting European Veterinary Congress of Behavioural Medicine and Animal Welfare – EVCBMAW 2022 - Palma (Mallorca) – 28 September – 1 October 2022. Oral presentation, proceedings p. 45.
4. Among the first ones, on a case of lack of ectoparasites treatment and undernourishment, Cassazione penale n. 9556, 13/08/1998.
5. Codice Civile. Regio Decreto 16 marzo 1942, n. 262 e s.m.i.
6. Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community, signed at Lisbon, 13 December 2007. Official Journal of the European Union (2007/C 306/01).
7. Codice Penale. Regio Decreto 19 ottobre 1930, n. 1398 e s.m.i.

A critical review of behavioral problems in geriatric cats

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Abstract: With improvements in nutrition and veterinary medicine, the life expectancy of pet cats is increasing and the number of elderly cats seen by veterinary surgeons is growing [1]. Even though ageing itself is not a disease, it is associated with a gradual decrease of the adaptive capacity of organs and body systems, first of all the central nervous system. This results in a sort of behaviour disorganization and the emergence of cognitive and emotional changes; a worsening of pre-existing behaviour changes can also occur [2]. The article reviews the literature about distribution, causes, neuropathology, clinical signs, diagnosis and potential management options for age-related feline disorders, even if the revision is focused on the cognitive dysfunction syndrome (CDS). CDS is an established condition in cats that shares many similarities with human Alzheimer's disease (AD), where cognitive decline ultimately results in dementia [3]. It is important to diagnose CDS promptly in cats, ruling out other causes for these behavioural changes, to provide effective management. Interventions include environmental enrichment, dietary supplementations, specific diets and medication. The aims of this review are to describe the state of the art of the available scientific information on the feline behavioral geriatric, and to report the guidelines for diagnosis and therapy. By doing so, it furthers our understanding of this condition and allows improved health, welfare and quality of life of affected cats.

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References

1. Sordo, L.; Breheny, C.; Halls, V.; Cotter, A.; Törnqvist-Johnsen, C.; Caney, S.M.A. Prevalence of disease and age-related behavioural changes in cats: past and present. *Vet Sci.* 2020, 7, 1–19.
2. Landsberg, G.M.; Hunthausen, W.; Ackerman, L. *Handbook of Behavior problems of the dog and cat*, 2nd ed.; Saunders, USA, 2003; pp. 269–304.
3. Gunn-Moore, D.; Moffat, K.; Christie, L.A.; Head, E. Cognitive dysfunction and the neurobiology of ageing in cats. *J Small Anim Pract.* 2007, 48, 46–53.

Veterinary Urban Hygiene: a pilot project

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Abstract: The Veterinary Urban Hygiene (VUH) is a branch of Veterinary Public Health. Its first official definition goes back to 1977 when the risk for public health linked to the presence of animals in urban areas was discussed the first time. In 1999, the VUH has been defined as “the activity dealing with those health aspects associated with human-animal-environment relationships in urban areas”. In Italy, the National Reference Centre for VUH was established in 2013 (Istituto Zooprofilattico Sperimentale Abruzzo e Molise, Teramo). With the increase of the animals in urban areas, VUH has been recently included in the field of the Veterinary Public Health at the level of the Local Veterinary Services (LVS). The aim of this study is to briefly present and then discuss the data of a pilot project in an LVS (01/10/2018-28/09/2022), where a VUH veterinary team has worked on the following health, welfare, behavioural and bio-security skills: • Canine registry and stray dog prevention • Rabies prevention and dangerous dogs’ control • Feline colonies • Non-commercial and commercial UE and extra-UE movement of pets • Vigilance for preventing/correcting crimes against animals • Pet-therapy • Laboratory animals, circuses and exotics surveillance • Educational and training programs • Public and private shelters, breeding, pet shops vigilance The results confirmed the crucial role of VUH in the veterinary prevention system, highlighted in environmental emergencies such as the recent Coronavirus Disease (COVID-19), when urban animals needed to be rescued, cared for, managed from the health and welfare point of view.

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References

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Performance of cloned minipigs belonging to three different clone populations in a detour test

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Abstract: Genetics, uterine environment, maternal behavior, and rearing conditions are all factors that may influence animal behavioral phenotype. Some studies on cloned pigs found no differences between the behavioral patterns of cloned and non-cloned animals. Conversely, other studies conducted on dogs reported similarities in cloned subjects’ behavior. The aim of this study was to assess the ability of 12 cloned minipigs belonging to three different clone populations (A, B, C) to detour around symmetric and asymmetric barriers in order to investigate and compare the cognitive abilities. In particular, the detour time and the detour entry/exit pattern were collected. Statistical analysis was performed on results. All the animals tended to keep a fixed entry/exit pattern instead of modifying it to accommodate changes in the working set. Significant differences were found between the populations in terms of detour time, with animals belonging to population A being faster than the others. Differences were highlighted within each population between the individuals. Our study is one of the few to assess the cognitive abilities of cloned minipigs. The results suggest that even cloned animals seem to have different cognitive characteristics, based on different behavioral characteristics. Cloning to obtain the same behavioral phenotype is therefore still a matter of debate.

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References

- Coulon M, Baudoin C, Abdi H, Heyman Y, Deputte BL (2010). Social behavior and kin discrimination in a mixed group of cloned and non cloned heifers (*Bos taurus*). *Theriogenology*. 74(9):1596-603. doi: 10.1016/j.theriogenology.2010.06.031
- Archer, Gregory & Friend, Ted & Piedrahita, Jorge & Nevill, C. & Walker, S. (2003). Behavioral variation among cloned pigs. *Applied Animal Behaviour Science*, 81. 321-331. doi: 10.1016/S0168-1591(02)00272-1.
- Søndergaard, Lene & Herskin, Mette & Ladewig, Jan & Holm, Ida & Dagnaes-Hansen, Frederik. (2012). Effect of genetic homogeneity on behavioural variability in an object recognition test in cloned Göttingen minipigs. *Applied Animal Behaviour Science*. 141. 20-24. doi: 10.1016/j.applanim.2012.07.006.
- Kabadayi, Can & Bobrowicz, Katarzyna & Osvath, Mathias. (2018). The detour paradigm in animal cognition. *Animal Cognition*. 21. doi: 10.1007/s10071-017-1152-0.
- Savage, Amy & Maull, John & Tian, Xiuchun & Taneja, Maneesh & Katz, Larry & Michael, Darre & Yang, Xiangzhong. (2003). Behavioral observations of adolescent Holstein heifers cloned from adult somatic cells. *Theriogenology*. 60. 1097-110. doi: 10.1016/S0093-691X(03)00110-9.
- Shin CW, Kim GA, Park WJ, Park KY, Jeon JM, Oh HJ, Kim MJ, Lee BC (2016). Learning, memory and exploratory similarities in genetically identical cloned dogs. *J Vet Sci*. 17(4):563-567. doi: 10.4142/jvs.2016.17.4.563
- Choi J, Lee JH, Oh HJ, Kim MJ, Kim GA, Park EJ, Jo YK, Lee SI, Hong DG, Lee BC (2014). Behavioral analysis of cloned puppies derived from an elite drug-detection dog. *Behav Genet*. 44(1):68-76. doi: 10.1007/s10519-013-9620-z
- Kim MJ, Oh HJ, Hwang SY, Hur TY, Lee BC (2018). Health and temperaments of cloned working dogs. *J Vet Sci*. 19(5):585-591. doi: 10.4142/jvs.2018.19.5.585
- Nawroth C, Langbein J, Coulon M, Gabor V, Oesterwind S, Benz-Schwarzburg J, von Borell E (2019). Farm Animal Cognition-Linking Behavior, Welfare and Ethics. *Front Vet Sci*. 12;6: 1-16. doi: 10.3389/fvets.2019.00024. PMID: 30838218; PMCID: PMC6383588.
- Baragli P, Vitale V, Sighieri C, Lanata A, Palagi E, Reddon AR (2017). Consistency and flexibility in solving spatial tasks: different horses show different cognitive styles. *Sci Rep*. 7(1): 1-12. doi: 10.1038/s41598-017-16729-z
- Hobhouse LT (1901) *Mind in evolution*. The Macmillan Company, New York Osthau B, Marlow D, Ducat P (2010) *Minding the gap: spatial perseveration error in dogs*. *Anim Cogn* 13:881–885. doi: 10.1007/s10071-010-0331-z
- Pongracz P, Miklosi A, Kubinyi E, Topal J, Csanyi V (2003a) Interaction between individual experience and social learning in dogs. *Anim Behav* 65:595–603. doi: 10.1006/anbe.2003.2079
- Pongracz P, Miklosi A, Timar-Geng K, Csanyi V (2003b) Preference for copying unambiguous demonstrations in dogs (*Canis familiaris*). *J Comp Psychol* 117:337. doi: 10.1037/0735-7036.117.3.337
- Tran TTU, Esseily R, Bovet D, Király I. One Function One Tool? A Review on Mutual Exclusivity in Tool Use Learning in Human and Non-human Species (2021). *Front Psychol*. 12: 1-9. doi: 10.3389/fpsyg.2021.603960
- Dukas, Reuven. (2004). Evolutionary Biology of Animal Cognition. *Annu. Rev. Ecol. Evol. Syst*. 35. 347-74. 10.1146/annurev.ecolsys.35.112202.130152.

Successful treatment of complex regional pain syndrome in a mare

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Abstract: An adult Warmblood mare underwent bilateral ovariectomy and began kicking at her flank 5 days post-operatively. Six weeks down the line and despite multimodal analgesia this response had deteriorated to the point at which she was considered dangerous to handle. Placement of a rug was the only way to stop this behavioural response, assumed via the gate control theory [1]. Clinical evaluation revealed hyperaesthesia and sweat patches associated with the surgical sites as well as inguinally. However, the surgical sites had healed well and there was no other evidence of ongoing pathology after extensive evaluation. This presentation is consistent with complex regional pain [2] a rare syndrome in horses and for which successful treatment has not been described. A Biopsychosocial approach including environmental modification to meet the mares ethological needs, use of a psychopharmaceutical (Amitriptyline 1mg/kg bid), alterations in how staff interacted with her, exercise and a behaviour modification plan to counter condition this response were employed. This approach was successful and within a few weeks the mare was happy with no rug on. She has since resumed her normal routine and is back in full ridden work. We believe this is the first case that has ever been successfully treated and this approach should be considered for other cases of complex regional pain. No conflicts of interest or funding are relevant to this case report.

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References

1. Mendell, L.M. Constructing and deconstructing the gate theory of pain. *Pain*. (2014) Feb;155(2):210-216. doi: 10.1016/j.pain.2013.12.010
2. Collins, N.M. et al. "Suspected Complex Regional Pain Syndrome in 2 Horses." *Journal of veterinary internal medicine* (2006) 20.4: 1014-1017.

Is there an attachment bond between family pigs and their owners? A pig-dog comparative study

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Abstract: Domestic dogs show owner-oriented attachment behaviours that are functionally analogue to those displayed by human infants towards their mothers [1, 2]. Previous research points to an evolutionary preparedness of dogs to form attachment bonds with their owners, who they use as a secure base and safe haven [3]. However, if this preparedness is caused by the general domestication process or by the specific selection for close cooperation with humans, needs further investigation. To answer this question, it seems important to compare the human-oriented attachment patterns of different domestic species living in similar conditions as dogs, as this approach lacks systematic research. Using a Strange Situation Test (SST) [4] we compared the behavioural patterns of attachment of young companion pigs (N=11) and dogs (N=15) towards their owners. Behavioural observations rendered three major factors that were analysed; Attachment to the owner, Anxiety in the strange situation, and Acceptance of the stranger. According to the results; 1) dogs but not pigs showed specific patterns of Attachment behaviours towards the owner, 2) dogs' Attachment was higher than that of pigs, 3) pigs' Acceptance score was higher than that of dogs, 4) Attachment scores positively correlated with Anxiety scores (which might indicate that the SST was valid). Overall, our findings do not support the emergence of a human-analogue attachment bond in young companion pigs towards their owners, even after intense socialization. The dog-owner attachment might be a unique interspecific bond facilitated by dogs' artificial selection for dependence on and cooperation with humans.

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References

1. Ainsworth, M. D. S., & Wittig, B. A. (1969). Attachment and exploratory behaviour of one-year-olds in a mge situation In BM Foss (Ed.), *DeterrniRants of infant behaviour* (pp. 1 13-1 36).
2. Riggio, G., Gazzano, A., Zsilák, B., Carlone, B., & Mariti, C. (2020). Quantitative behavioral analysis and qualitative classification of attachment styles in domestic dogs: Are dogs with a secure and an insecure-avoidant attachment different?. *Animals*, 11(1), 14.
3. Topál, J., Gácsy, M., Miklósi, Á., Virányi, Z., Kubinyi, E., & Csányi, V. (2005). Attachment to humans: a comparative study on hand-reared wolves and differently socialized dog puppies. *Animal behaviour*, 70(6), 1367-1375.
4. Topál, J., Miklósi, Á., Csányi, V., & Dóka, A. (1998). Attachment behavior in dogs (*Canis familiaris*): a new application of Ainsworth's (1969) Strange Situation Test. *Journal of comparative psychology*, 112(3), 219.

Comparison between air circulation and paddle fans in a dairy tie-stall barn in conditions of moderate/severe heat stress risk

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Abstract: Dairy cows are particularly sensitive to heat stress, which can lead to physiological disorders that negatively affect their welfare [1, 2]. The fact that temperatures are set to rise due to climate change, further exacerbates the urgency of finding the best strategies to ensure both animal welfare and production efficiency [2]. The aim of the present study was to investigate the effect of the two most widely used ventilation systems, namely the air circulation fan (AC-F) and the paddle fan (P-F), in conditions of moderate/severe risk of heat stress (THI>80), on the environmental parameters in a dairy barn of the “Parmigiano Reggiano” consortium. The fans were installed in two different areas of the barn. Between July and September 2021, indoor environmental parameters (temperature, relative humidity, fine dusts, and gases) were monitored using dataloggers positioned in six different sites for each type of fan. Outdoor temperature and humidity index THI was also recorded. Data were analysed using a one-way ANOVA. The present results show that the AC-F tended to guarantee a lower environmental temperature (T-AC-F=26.1 vs T-P-F=26.9°C; p=0.052), and a lower CO₂ concentration (CO₂-AC-F= 0.04 vs CO₂-P-F=0.05%; p<0.001). AC-F were also associated with a significant increase in air speed (AS-AC-F=2.62 vs AS-P-F=1.37 m/s; p<0.001). The present data show that P-Fs, although widely used, may not be the solution for achieving an optimal microclimate for the animals in conditions of moderate/severe heat stress risk, as they are rather designed to destratify the air than to cool it.

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References

1. Herbut, P.; Hoffmann, G.; Angrecka, S.; Godyń, D.; Vieira, F. M. C.; Adamczyk, K.M.; Kupczyński, R. The effects of heat stress on the behaviour of dairy cows – a review. *Ann Anim Sci*, 2021, 21, 385-402.
2. Tao, S.; Orellana Rivas, R. M.; Marins, T. N.; Chen, Y.-C.; Gao, J.; Bernard, J. K. Impact of heat stress on lactational performance of dairy cows. *Theriogenology*, 2020, 150, 437-444.
3. Hempel, S.; Menz, C.; Pinto, S.; Galán, E.; Janke, D.; Estellés, F.; Müschner-Siemens, T.; Wang, X.; Heinicke, J.; Zhang, G.; Amon, B.; del Prado, A.; Amon, T. Heat stress risk in European dairy cattle husbandry under different climate change scenarios – uncertainties and potential impacts. *Earth Syst Dyn*, 2019, 10, 859-884.

House-soiling predicts spatial memory performance in senior cats

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Abstract: Senior cats can show signs of feline cognitive dysfunction syndrome (CDS), a neurodegenerative condition associated with disorientation, altered interactions, altered sleep-wake cycle, house-soiling, activity levels and anxiety (DISHA [1]). We hypothesised that the severity of DISHA signs affected the performance in a spatial memory test. A sample of 27 cats (MdnAge=9 years, range=7-15 years; Females=12, all spayed) that attended two veterinary centres for routine health exams underwent a spatial memory test performed at home by their owner [2,3] and were assessed through semi-structured interviews, where a higher score in each DISHA domain indicated more severe and frequent signs, emerged late in life [1]. For the memory test, the cats witnessed the owner baiting 1 of 5 identical plastic containers. After a 30 seconds distraction, the cats were allowed to seek for the food. The test was repeated once per container in a pseudo-randomised order. Results from generalized linear mixed model indicated that the cats with more severe house-soiling were less likely to find food on their first attempt (Correct choice binomial model: AIC=183.30, Chisq(1)=8.38, p=0.004; house-soiling estimate=-0.33+/-0.13, p=0.009), and performed more mistakes or did not engage in the task, especially in the latest trial (Mistakes poisson model: AIC=183.30, Chisq(1)=8.38, p=0.004; house-soiling estimate=0.17+/-0.08, p=0.035; Trial5 estimate=1.10+/-0.52, p=0.032). This task represents the first evidence of a relationship between spatial memory that does not require explicit training and an age-related owner-reported behaviour problem. The results shed a light on the potential cognitive mechanisms underlying house-soiling in senior cats.

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References

1. Bellows Jan, Sharon Center, Leighann Daristotle, Amara H. Estrada, Elizabeth A. Flickinger, Debra F. Horwitz, B. Duncan X. Lascelles et al. "Evaluating aging in cats: How to determine what is healthy and what is disease." *Journal of Feline medicine and surgery* 18, no. 7 (2016): 551-570.
2. Azadian Amin, and Daniëlle A. Gunn?Moore. "Age?related cognitive impairments in domestic cats naturally infected with feline immunodeficiency virus." *Veterinary Record* 191, no. 1 (2022)
3. Piotti Patrizia, Andrea Piseddu, Enrica Aguzzoli, Andrea Sommese, and Eniko Kubinyi. "Two valid and reliable tests for monitoring age-related memory performance and neophobia differences in dogs." *Scientific Reports* 12, no. 1 (2022): 16175.

Public consultation on developing a national strategy for managing free-roaming cats in Israel

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Abstract: The issue of free-roaming cats (FRC) is a highly controversial one, with an ongoing debate over best practices for controlling their population. In Israel, the continuing increase in the FRC population creates serious concerns regarding their own welfare, public health, urban sanitation, ecological balance and wildlife biodiversity. Due to the complexity and sensitivity of the subject, many stakeholders are involved in the discussion regarding FRC management; from animal activists and cat caretakers, private and municipal veterinarians, ecologists and zoologists, epidemiologists and public health experts, to those who view FRC as a nuisance or as a community asset and the general public who encounters them in various contexts. It was therefore imperative to engage and consult with all interested parties prior to drafting a formal government policy for managing FRC. The department of Animal Welfare (Israeli Veterinary Services) entrusted with the matter, has been heading an extensive process of consulting with all stakeholders and the public at large via in-depth interviews, focus groups, surveys and roundtables. The main themes that have surfaced are the need for public education regarding FRC's welfare as well as the negative impacts of their presence, the need for comprehensive cooperation between authorities, veterinarians and cat caretakers and the regulation of communal feeding. This has outlined the multifaceted relationship between people and FRC, highlighting both disagreement and consensus on matters such as feeding, TNR programs, population culling and the broad scale of human attitudes towards these animals and their presence in the public sphere.

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Improving animal welfare for disbudding calves: a practical approach

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Abstract: Dehorning is a common practice in dairy cattle because it facilitates handling, reduces aggressive behaviours and prevents injuries to both people and other herd mates. Disbudding is a painful and stressful practice if it is performed without pain killers. Hot-iron disbudding using anaesthesia and analgesia is the current recommended procedure. The objective of this study was to transfer scientific knowledge at farm level to improve animal welfare during disbudding through practical workshops with veterinarians and farmers. Six workshops were conducted from March to August 2022, involving a total of 22 farmers and 3 veterinarians (5-7 participants each workshop). Each workshop included an audio-guide explanation, a practice demonstration, and disbudding calves under supervision. Before the workshops, 57.1%, 23.8% and 19.1% of participants used hot-iron, chemical paste and chemical stick for disbudding, respectively. Anaesthesia was used by 4.7%, analgesia by 33.3%, and sedative by 66.7% of participants. After the workshops, 62% of participants changed the method of disbudding following the standard recommendations (hot iron method using anaesthesia and analgesia), a 19% changed the method partially (including analgesia), whereas a 19% did not change it. The main reason why farmers did not improve the technique was the difficulty to acquiring anaesthetics and/or analgesics, since it can only be manipulated by veterinarians. This fact was highlighted in all workshops. In conclusion, training allows changing farmers habits towards a better animal welfare during disbudding. Veterinarians play a fundamental role to promote and conduct painless protocols for disbudding calves.

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Social fear or trauma? Generalising fear in a Border Terrier

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Abstract: Introduction (anamnesis and aetiology) A 10-year-old female neutered Border Terrier was presented with 'fear' around certain family friends. The symptoms (panting, restlessness, avoidance reactions) commenced 2-years-ago. At the same time, there was a decline in the owner's mental and physical health which led to changes in her interactions (towards her friends and dog (e.g. sudden outbursts of anger)) and to acute, stressful situations (e.g. her almost suffocating) in the presence of her friends and dog. The medical history of the dog mentioned (well-managed) arthritis. Routine hematology and biochemistry revealed no clinically relevant abnormalities. The dog showed normal behaviour during the behaviour observation in the clinic. Physical examination No abnormalities detected. Diagnosis Anxiety-related disorder, potentially due to the presence of acute and chronic (social) stressors resulting in dysregulations in fear and/or extinction learning [1-3]. Case management Treatment was initiated with 0.5 mg/kg fluoxetine (SID) and 0.04 mg/kg alprazolam (PRN). Further recommendations included appropriate management and the use of techniques encouraging relaxation (based on the Protocol for Deference and the Protocol of Teaching Your Dog to Take a Deep Breath and Use Other Biofeedback Methods as Part of Relaxation [4]). The dog's behaviour greatly improved within 2 months of treatment initiation. Conclusions and relevance to the field This case highlights the need to assess the emotional well-being of dogs when going through stressful (and potentially traumatic) periods due to changes in their social environment (related to their social bond to their owner).

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References

1. Fraunfelder, L., Gerdes, A.B.M. and Alpers, G.W. Fear one, fear them all: A systematic review and meta-analysis of fear generalization in pathological anxiety. *Neurosci. Biobehav. Rev.* 2022, 139, p. 104707.
2. Lange, I., Goossens, L., Bakker, J., Michielse, S., Marcelis, M., Wichers, M., van Os, J., van Amelsvoort, T. and Schruers, K. Functional neuroimaging of associative learning and generalization in specific phobia. *Prog. Neuro-Psychopharmacol. Biol. Psychiatry*, 2019, 89, pp. 275-285.
3. Raio, C.M., Phelps, E.A. The influence of acute stress on the regulation of conditioned fear. *Neurobiol. Stress*, 2015, 1, pp. 134-146.
4. Overall, K.L. *Manual of Clinical Behavioral Medicine for Dogs and Cats*, Elsevier Health Sciences: St. Louis, USA, 2013; pp. 574-580.

Don't leave me, I will panic! Or will I?

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Abstract: Anamnesis and aetiology A 2-year-old crossbred female neutered dog presented with episodes of seemingly unprovoked anxiety. The symptoms (sudden onset of dilated pupils, trembling, vocalizing, panting and seeking contact) commenced 3 months ago at night and had since then progressed in frequency and duration since. Preparing for bedtime was one trigger, however others remained unclear. The dog had shown signs of separation-related problems (excessive vocalizations and destructive (escape-related) behaviours in absence of the owners) in the past and just prior to the onset of these symptoms. There were no relevant abnormalities in the dog's medical history, including routine blood (hematology and biochemistry)- and urine analysis and an abdominal ultrasound. During the in-clinic behaviour observation the dog was able to settle down, but reacted anxiously (panting, jumping up on the owners lap) when startled (e.g. when the owners raised their voices). The physical examination was unremarkable. **Diagnosis** • Anxiety disorder (with anxious and/or panic outbursts) • Separation anxiety • Firework phobia • Fear of being transported in a car **Case management** Treatment was initiated with 200 mg gabapentin (TID), 10 mg fluoxetine (SID) and benzodiazepines (PRN). Further recommendations included appropriate management and teaching the dog relaxation cues using positive reinforcement (based on the Protocol for Deference [1]). The 'sudden' episodes decreased in frequency and intensity. **Conclusions** This case highlights the importance of assessing all diagnoses and their interactions in dogs [2], specifically as a relation between separation anxiety and panic seems possible [2] (as been hypothesized in humans [3]).

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References

1. Overall, K.L. Manual of Clinical Behavioral Medicine for Dogs and Cats, Elsevier Health Sciences: St. Louis, USA, 2013; pp. 574-580.
2. Overall, K.L. Manual of Clinical Behavioral Medicine for Dogs and Cats, Elsevier Health Sciences: St. Louis, USA, 2013; pp. 238-250.
3. Gittelman, R., Klein, D.F. Relationship between separation anxiety and panic and agoraphobic disorders. *Psychopathology*, 1984, 17 (Suppl. 1), pp. 56-65.

Analysis of the dominance concept in the domestic dog through the observation of intraspecific communication – preliminary results

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Abstract: The presence of dominance relationships in domestic dogs is controversial [1-2]. Furthermore, an open question is whether dominance is a personality trait or a feature of relationships. The aims of the present study were to evaluate the existence of dominance, as presence of asymmetries in the exchange of behaviours, and to assess whether it is a trait of personality or a feature of relationships. Eighteen adult dogs met 4 different recipient dogs (female unfamiliar, female familiar, male unfamiliar, male familiar) off-leash, within a fence, for 5 minutes. Frequency of 36 behaviours grouped into 6 categories (best indicators of submission, best indicators of dominance, other indicators of dominance, aggressive behaviours, play, submissive-affiliative behaviour) were recorded. Starting from the scientific literature, two indexes measuring symmetries/asymmetries in the meetings and one index measuring consistency/non-consistency in behaviours displayed by the same subject in different meetings were calculated.

Chi-Square test ($p < 0.05$) was used to compare the number of meetings characterized by asymmetry versus non-asymmetry and to compare the number of dogs with consistent versus non-consistent behaviour across meetings. Results suggested that meetings between dogs were usually asymmetrical (number of asymmetrical versus non-asymmetrical meetings: 45 vs 27, $p < 0.05$) in line with some previously published studies, although a direct comparison with them is difficult due to significant methodological differences. However, dominance did not appear to be a personality trait, as dogs modified their behaviour in different meetings (number of subjects with constant behaviour versus non-constant: 0 vs 18, $p < 0.05$).

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References

1. Cafazzo, S.; Valsecchi, P.; Bonanni, R.; Natoli, E. 2010. Dominance in relation to age, sex, and competitive contexts in a group of free-ranging domestic dogs. *Behav. Ecol.* 2010, 21(3), 443-455.
2. Bradshaw, J.W.S.; Blackwell, E.J.; Casey, R.A. Dominance in domestic dogs-useful construct or bad habit? *J. Vet. Behav.* 2009, 4, 135-144.

Treatment of anxiety towards people and noise phobia in a mongrel dog through a multimodal approach

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Abstract: A 5-year-old neutered female mongrel dog, Kelly, was presented to consultation for avoidance behaviour, restlessness, barking, bite attempt towards people in home environment. Furthermore, the owner reported that Kelly showed signs of discomfort (trembling, pacing) during storms. Anxiety towards people associated with reactive behaviours, and phobia of thunder and storm noises were diagnosed through anamnesis and observation of dog behaviour [1]. Medical issues were excluded with clinical examination and blood exams. The veterinary behaviourist prescribed the therapeutic intervention, based on a multimodal approach. It included behavioural rehabilitation focussed on improvement of dog's emotional states, performed by the veterinary behaviourist and a dog trainer, and a nutraceutical treatment, i.e. melatonin and 5-hydroxytryptophan. Anxiety signs towards people decreased in about 3 months, except for restlessness and barking whenever a male person related to the owner entered Kelly's house and stayed there. Then, 5-hydroxytryptophan was discontinued and administration of gabapentin at a dose of 26 mg/kg when Kelly was in presence of the man was started. Moreover, in order to facilitate the interaction between Kelly and the man, pleasant walks in natural environment with the man and the owner were performed. Behavioural signs improved in about 12 months. Thunder and storm phobia was treated with trazodone (punctual use, at a dose of 5.3 mg/kg) [2] and environmental management with satisfying result. This rehabilitation program helped Kelly with her emotional discomfort. The multimodal approach addressed in the present case report could be helpful in the treatment of such problems in dogs.

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References

1. Landsberg, G.; Hunthausen, W.; Akerman, L. *Behavior Problems of the Dog and Cat*, 3rd ed.; Elsevier Ltd.: Amsterdam, NL, 2013.
2. Piotti, P.; Uccheddu, S.; Alliani, M.; Mariti, C.; Nuti, V.; Ogi, A.; Pierantoni, L.; Gazzano A. Management of specific fears and anxiety in the behavioral medicine of companion animals: punctual use of psychoactive medications. *Dog Behav.* 2019, 2, 23-30.

The Relationship between Dog's Chronic Stress, attachment behaviours and Owner's Emotional Support

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Abstract: Dogs may show different attachment patterns towards their caregivers, mainly depending on the quality of the owner's caregiving behaviour [1, 2]. Unlike in humans, the relationship between dog's insecure attachment and long-term, stress-related physiological changes has not been investigated. One-hundred dog-owner dyads participated in the Strange Situation Procedure (SSP). Dogs were scored for six attachment behaviour dimensions (Proximity/contact seeking, Contact maintenance, Resistance, Avoidance, Separation distress, Distance interactions) and were qualitatively classified as either securely or insecurely attached to their owner. Afterwards, dogs underwent a standardized veterinary procedure during which their hair was sampled to measure cortisol concentrations. Throughout the veterinary procedure, owners were scored for supportive behaviour towards their dog. Differences in hair cortisol concentrations and owners' supportive behaviour between secure and insecure dogs were assessed using Mann-Whitney U test, whereas the association between hair cortisol concentrations, dogs' attachment behaviour dimensions, and owners' emotional support was investigated using Spearman correlations. No difference in hair cortisol concentrations was found between securely and insecurely attached dogs. However, emotional support behaviour was significantly higher in secure dogs' owners ($U=477.0$, $p=0.002$). Cortisol concentrations were negatively correlated with dog's Proximity/contact seeking ($\rho=-0.248$, $p=0.016$), and Contact maintenance ($\rho=-0.27061$, $p=0.012$), as well as with owner's supportive behaviour ($\rho=-0.357$, $p=0.001$). The latter was also negatively correlated with dog's Resistance ($\rho=-0.350$, $p=0.001$) and Avoidance ($\rho=-0.236$, $p=0.027$). Owner's emotional support seems to have a central role in shaping dogs' attachment behaviours during the SSP and long-term cortisol reactivity. Nonetheless, no direct relationship was found between dog attachment insecurity and chronic stress.

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References

1. Riggio, G. (2020). A mini review on the dog-owner attachment bond and its implications in veterinary clinical ethology. *Dog behavior*, 6(3).
2. Solomon, J., Beetz, A., Schöberl, I., Gee, N., & Kotrschal, K. (2019). Attachment security in companion dogs: Adaptation of Ainsworth's strange situation and classification procedures to dogs and their human caregivers. *Attachment & human development*, 21(4), 389-417.

Shake It Off! Using the Strange Situation Procedure (Ssp) to Investigate The Role of Body Shaking as an Indicator of Emotional Relief in Dogs

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Abstract: Previous studies suggested that dogs' body shaking may be an indicator of relief rather than a direct indicator of stress [1]. The Strange Situation Procedure (SSP) may be used to investigate some contextual aspects of dogs' shaking behaviour. Thirty-three dogs participated in the SSP (7-episodes) with their owners. Before and after the test saliva samples were taken from the dogs to measure oxytocin concentrations. The frequency of dogs' body shaking was recorded and analysed with a Friedmann test to investigate differences across episodes (2-7). Regression analysis was performed to assess the effect of decreasing/increasing stress on the expression of body shaking, whereas Spearman correlation was used to identify possible associations between body shaking during reunion episodes with the owner and oxytocin salivary concentrations. Body shaking ($X^2(5)=51.58, p<0.001$) was significantly higher in episode 4 and 7 –in the presence of the owner- compared to 5 –when the dog was left alone-, 3 and 6 –in the presence of the stranger, only. Body shaking was more likely to be performed during episodes in which the level of stress was supposedly decreasing (4, 6 and 7) rather than increasing (2, 3 and 5) ($B=0.338, t=3.217, p=0.002$). Finally, body shaking in episode 7 was positively correlated with dogs' oxytocin concentrations ($\rho=0.403, p=0.046$). These results suggest that dog body shaking may often mark a shift from a higher to a lower state of arousal, reflecting emotional relief. Its expression may be affected by the relationship with the individual acting as a stress buffer.

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References

1. Rehn, T. and Keeling, L.J., 2011. The effect of time left alone at home on dog welfare. *Applied Animal Behaviour Science*, 129(2-4), 129-135.

Veterinary practitioners in court: investigation on the death of a cat

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Abstract: Veterinarians are often called to court to handle cases involving animals [1]. In Italy, killing an animal out of cruelty or without necessity is punished by imprisonment [2]. We were called as expert witnesses in an animal cruelty case involving a cat allegedly killed by a man, in order to determine the cause of death (COD), and in particular if the cat had been killed by being beaten and/or knocked to the ground. After thawing at 4°C, the cat was subjected to computed tomography (CT) prior to necropsy. X-ray images were acquired to estimate the cat's age. The cat was in good body conditions, with no evident skin lesions and fur anomalies. Age was estimated between 4 and 7 months old [3]. CT highlighted the presence of three fractured right ribs and thoracic vertebrae (T2-T3). Pneumothorax, pneumomediastinum, pneumoperitoneum, pneumocephalus, and pneumorrhachia, were observed. Necropsy findings included haemorrhages of the left ventrolateral abdominal wall, left thoracic wall, lungs and penis. Blood collection was found in the thorax, trachea and mouth. The vertebral fractures were deemed to be post-mortem. There were no signs of head trauma. Cats are the companion animals that suffer the most human abuse [4].

Combining post-mortem CT with necropsy helped identifying and characterizing bone fractures, soft tissue haemorrhages, gas accumulation in body cavities, as previously demonstrated [5]. COD was attributed to hypovolemic shock resulting from the massive lung haemorrhage, probably caused by kicking or, less likely, by blunt force trauma. Therefore, unlawful killing could not be reasonably excluded.

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References

1. Bailey, D. Introduction – What is Veterinary Forensics? In *Practical Veterinary Forensics*; Bailey, D., Ed.; CABI: Oxfordshire, UK, 2016; pp. 1-11.
2. Disposizioni concernenti il divieto di maltrattamento degli animali, nonché di impiego degli stessi in combattimenti clandestini o competizioni non autorizzate, Italian National Law 189, 2004; *Official Journal*, Issue 178, 2004.
3. Sutton, L.K., Byrd, J.H., Brooks, J. W. Age Determination in Dogs and Cats. In *Veterinary Forensic Pathology*; Brooks, J.W., Ed.; Springer: Cham, Switzerland, 2018; vol. 2, pp. 151-164.
4. Lockwood, R. Cruelty toward cats: Changing perspectives. In *The state of the animals III*; Salem, D.J., Rowan, A. N., Eds.; Humane Society Press: Washington DC, USA, 2005; pp. 15-26.
5. Ribas, L.M., Massad, M.R., Pinto, A.C., Heng, H.G., Tremori, T.M., Reis, S.T., Baroni, C.O., Massad. E., Rocha, N.S. Post-mortem CT vs necropsy in feline medicine. *J. Feline Med. Surg.* 2020, 22, 206-213.

Microbiome and metabolomic profiles in phobic and healthy dogs

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Abstract: The past decade has seen a renewed interest between the composition of intestinal microbiome and behavioral and psychological disorders in mammals [1,2]. Thus, we hypothesized that the composition of the canine gut microbiome might be associated with behavioral disorders, including anxiety and phobia [3]. To this aim, we analyzed fecal microbiome samples collected from a population of dogs affected by phobic disorder and normal behavior. Next generation sequencing of the V4-V6 gene region of the bacterial 16S rRNA was employed to determine gut microbiome composition. Our results showed an increase of Firmicutes phylum in dogs with phobia, when compared to healthy controls. At genus level, we documented in patients a significant higher abundance of *Clostridium*, a genus of anaerobic, Gram-positive bacteria. Then, we performed a targeted mass spectrometry-based metabolomic analysis on serum samples to assess a potential correlation between the gut microbiome alteration and metabolomic profile. Volcano plot analysis showed in phobic dogs increased levels of the microbiota-derived product, acid lactic, which is considered a key factor in the regulation of brain functions and, when altered, it seems to be causative of behavioral disorders [4]. Collectively, we suggest a putative association between the gut microbial composition and brain activity in dogs. Therefore, further functional studies are mandatory, in order to better disclose the underlying mechanisms of phobia, and pave the way for the development of therapeutic approach for such a dysfunctional disorder.

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References

1. Kirchoff, N.S.; Udell, M.A.R.; Sharpton, T.J. The gut microbiome correlates with conspecific aggression in a small population of rescued dogs (*Canis familiaris*). *PeerJ* 2019, 7, e6103, doi:10.7717/peerj.6103.
2. Farzi, A.; Frohlich, E.E.; Holzer, P. Gut Microbiota and the Neuroendocrine System. *Neurotherapeutics* 2018, 15, 5-22, doi:10.1007/s13311-017-0600-5.
3. Mondo, E.; Barone, M.; Soverini, M.; D'Amico, F.; Cocchi, M.; Petrulli, C.; Mattioli, M.; Marliani, G.; Candela, M.; Accorsi, P.A. Gut microbiome structure and adrenocortical activity in dogs with aggressive and phobic behavioral disorders. *Heliyon* 2020, 6, e03311, doi:10.1016/j.heliyon.2020.e03311.
4. Xueyi, C.; Yangdong, Z.; Haiyang, W.; Lanxiang, L.; Wenwen, L.; Peng, X. The regulatory effects of lactic acid on neuropsychiatric disorders. *Discover Mental Health* 2022, doi:https://doi.org/10.1007/s44192-022-00011-4.

Evaluating on farm welfare of dairy sheep reared in semi-extensive systems

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Abstract: The European Union requires national authorities to provide control plans based on specific indicators for each species and type of farming, aimed at ensuring a high level of animal welfare. This work aims at identifying welfare in semi- extensive dairy sheep farms using the protocol of the National Reference Centre for Animal Welfare (CReNBA), which includes four areas of assessment to classify farms into three levels of welfare: insufficient, acceptable and excellent. The survey was conducted on 12 dairy sheep farms and divided according to flock size: <500, from 500 and 1000, >1000. The most critical issues for all farms concerned the low ratio of the number of stockpersons to the number of animals on the farm, the small decubitus area available, the lack of udder cleaning procedures during milking operations and, in terms of biosecurity, the lack of structured and defined actions, as well as poor knowledge and monitoring of the main infectious ovine diseases. Most of the farms included in the study were classified acceptable for overall welfare in the four observed areas. The farms with greater animal consistency showed a more careful management of nutrition and groups (e.g. age, sex, stage of production and reproduction), but at the same time showed weaknesses in the number of daily inspections and in the provision of shelter for animals kept outside buildings. The latter were acceptable in the smaller farms.

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Trauma and its Behavioral Aftermath: A Systematic Review of the Impact of Disaster Deployment on Working Dogs

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Abstract: Dysfunctional behavior after deployment has been observed in working dogs and is known to impair their quality of work and quality of life [1,2]. In military working dogs, this phenomenon was classified as canine post-traumatic stress disorder (c-PTSD) in 2010 [3]. However, solid evidence in the literature to support this disorder in other types of working dogs is lacking. Therefore, this systematic literature review was performed to comprehensively analyze the possible evidence of dysfunctional behavior in working dogs linked to physical or psychological trauma that may have been sustained during disaster response operations. A search of the PubMed and Web of Science databases was conducted and finalized on February 1, 2023, resulting in the selection of 11 studies for review [4-14]. Both physical and behavioral effects during and after deployment were considered. The results showed that physical health consequences, such as wounds and gastrointestinal signs, were prevalent but mild. Additionally, although little systematic research has been done on behavioral consequences, some studies have reported changes in behavior during and after deployment, including fatigue, lethargy, and attitude changes. However, the condition of c-PTSD has not yet been systematically recognized. These results emphasize the importance of further research to thoroughly define this canine behavioral disorder and determine which triggers are associated with an increased risk of c-PTSD, to ensure the optimal productivity and welfare of working dogs.

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References

1. Evans, R.I.; Herbold, J.R.; Bradshaw, B.S.; Moore, G.E. Causes for Discharge of Military Working Dogs from Service: 268 Cases (2000–2004). *J. Am. Vet. Med. Assoc.* 2007, 231 (8), 1215–1220.
2. Lefebvre, D.; Diederich, C.; Delcourt, M.; Giffroy, J.M. The Quality of the Relation between Handler and Military Dogs Influences Efficiency and Welfare of Dogs. *Appl. Anim. Behav. Sci.* 2007, 104 (1–2), 49–60. <https://doi.org/10.1016/J.APPLANIM.2006.05.004>.
3. Burghardt, W.F. Jr. Preliminary Evaluation of Case Series of Military Working Dogs Affected With Canine Post-Traumatic Stress Disorder. Proceedings of the Animal Behavior Society, University of Toronto Scarborough Campus, Canada 2017.
4. Duhaime, R.A.; Norden, D.; Corso, B.; Mallonee, S.; Salman, M.D. Injuries and Illnesses in Working Dogs Used during the Disaster Response after the Bombing in Oklahoma City. *J. Am. Vet. Med. Assoc.* 1998, 212 (8), 1202–1207.
5. Gordon, L.E. Injuries and Illnesses among Urban Search-and-Rescue Dogs Deployed to Haiti Following the January 12, 2010, Earthquake. *J. Am. Vet. Med. Assoc.* 2012, 240 (4), 396–403.
6. Gordon, L.E.; Ho, B. Injuries and Illnesses among Human Remains Detection-Certified Search-and-Recovery Dogs Deployed to Northern California in Response to the Camp Fire Wildfire of November 2018. *J. Am. Vet. Med. Assoc.* 2020, 256 (3), 322–332.
7. Gordon, L.E. Injuries and Illnesses among Federal Emergency Management Agency-Certified Search-and-Recovery and Search-and-Rescue Dogs Deployed to Oso, Washington, Following the March 22, 2014, State Route 530 Landslide. *J. Am. Vet. Med. Assoc.* 2015, 247 (8), 901–908.
8. Slensky, K.A.; Drobotz, K.J.; Downend, A.B.; Otto, C.M. Deployment Morbidity among Search-and-Rescue Dogs Used after the September 11, 2001, Terrorist Attacks. *J. Am. Vet. Med. Assoc.* 2004, 225 (6), 868–873.
9. Fox, P.R.; Puschner, B.; Ebel, J.G. Assessment of Acute Injuries, Exposure to Environmental Toxins, and Five-Year Health Surveillance of New York Police Department Working Dogs Following the September 11, 2001, World Trade Center Terrorist Attack. *Disaster Med.* 2008, 233 (1), 48–59.

10. Fitzgerald, S.D.; Rumbeiha, W.K.; Braselton, W.E.; Downend, A.B.; Otto, C.M. Pathology and Toxicology Findings for Search-and-Rescue Dogs Deployed to the Terrorist Attack Sites: Initial Five-Year Surveillance. *J. Vet. Diagnostic Investig.* 2008, 20 (4), 477–484.
11. Hare, E.; Kelsey, K.M.; Niedermeyer, G.M.; Otto, C.M. Long- Term Behavioral Resilience in Search-and-Rescue Dogs Responding to the September 11, 2001 Terrorist Attacks. *Appl. Anim. Behav. Sci.* 2021, 234, 105173.
12. Otto, C.M.; Downend, A.B.; Serpell, J.A.; Ziemer, L.S.; Saunders, H.M. Medical and Behavioral Surveillance of Dogs Deployed to the World Trade Center and the Pentagon from October 2001 to June 2002. *J. Am. Vet. Med. Assoc.* 2004, 225 (6), 861–867.
13. Otto, C.M.; Downend, A.B.; Moore, G.E.; Daggy, J.K.; Ranivand, D.L.; Reetz, J.A.; Fitzgerald, S.D. Medical Surveillance of Search Dogs Deployed to the World Trade Center and Pentagon: 2001-2006. *J. Environ. Health* 2010, 73 (2), 12–21.
14. Otto, C.M.; Hare, E.; Buchweitz, J.P.; Kelsey, M.K.; Fitzgerald, S.D. Fifteen-Year Surveillance of Pathological Findings Associated with Death or Euthanasia in Search-and-Rescue Dogs Deployed to the September 11, 2001, Terrorist Attack Sites. *J. Am. Vet. Med. Assoc.* 2020, 257 (7), 734-743.

Efficacy of a synthetic feline facial pheromone (F3) in reducing undesired scratching: A randomized triple blind study

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Abstract: Scratching is a natural behaviour of cats which serves different functions including olfactory communication. Undesired scratching, on the other hand, is one of the most prevalent behavioural problems which may damage human-cat bond and even increase the risk for relinquishment of cats^{1,2}. Thus, using cat friendly approaches to manage scratching behaviour is important for ensuring healthy human-cat relationships and welfare of cats. A 28-day randomized triple blind study was designed to evaluate the efficacy of the synthetic analogue of feline facial pheromone (F3) in reducing undesired scratching in a home environment. A total of 1060 cat caregivers were divided into two groups, i.e., Pheromone Group (n=546) and Placebo Group (n=514) according to the products given to them, which were FELIWAY® Classic Diffuser or Placebo Diffuser. Participants answered an online questionnaire including questions regarding the scratching behaviours of their cats on the day 0 and also on the days 7, 14 and 28 following to start using the product. Significant differences were found between two groups considering the reduction in frequency and intensity of scratching (p<0.05). Accordingly, the reduction of the Index Score, i.e., Intensity x Frequency was significantly higher in Pheromone Group (p<0.05). It is concluded that the use of FELIWAY® Classic Diffuser, i.e.synthetic analogue of feline facial pheromones (F3), was effective in reducing undesired scratching in cats.

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References

1. Heidenberger, E. (1997). Housing conditions and behavioural problems of indoor cats as assessed by their owners. *Applied Animal Behaviour Science*, 52(3-4), 345-364.
2. Wilson, C., Bain, M., DePorter, T., Beck, A., Grassi, V., & Landsberg, G. (2016). Owner observations regarding cat scratching behavior: an internet-based survey. *Journal of feline medicine and surgery*, 18(10), 791-797.

Does welfare condition influence equine Strongyle egg shedding potential?

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Abstract: Responsible ownership entails providing continuous care that encompasses the protection of both the horse's health and welfare. In today's context, effective management of gastrointestinal parasites is crucial, particularly considering the increasing prevalence of anthelmintic resistance [1]. This study aimed at determining whether the welfare condition of horses could affect Strongyle egg shedding. A total of 199 sport and leisure horses (14±7 years old, different breeds and genders), housed in 11 stables, were assessed using the AWIN assessment protocol [2] by three trained assessors. The inclusion criteria required that the horses had received their last treatment for gastrointestinal parasites at least 2 months before the assessment. On the same day, fecal samples were collected. Strongyle fecal egg counts-FEC (expressed as eggs per gram of feces, EPG) were determined using the FLOTAC dual technique® [3]. A two-step cluster analysis identified two clusters based on the animal-based indicator scores (N=7): 77.9% of the horses were assigned to cluster1, while 22.1% to cluster2. Cluster2 had a higher proportion of horses with welfare issues, such as lesions, lameness, joint swellings, pain (HGS>3), suboptimal body condition score and human-horse relationship. An ANOVA was performed to compare the effect of the cluster on FEC. Horses in cluster1 had a significantly lower FEC (F=1.166; p=0.009) compared to horses in cluster2, with values of 115.01±26.43 and 172.75±46.49 EPG, respectively. In cluster1, 75.8% of horses had a FEC=0 EPG, while only 59.4% in cluster2. These results suggest that there may be an association between welfare condition and egg shedding potential.

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References

1. Smith, M.A., Nolan, T.J., Rieger, R., Aceto, H., Levine, D.G., Nolen-Walston, R. and Smith, B.I., 2015. Efficacy of major anthelmintics for reduction of fecal shedding of strongyle-type eggs in horses in the Mid-Atlantic region of the United States. *Veterinary Parasitology*, 214(1-2), pp.139-143.
2. Minero M., Dalla Costa E., Dai F., Scholz P., Lebelt D., 2015. AWIN Welfare assessment protocol for horses (doi: 10.13130/AWIN_horses_2015).
3. Cringoli G., Rinaldi L., Maurelli M.P., Utzinger J. (2010): "FLOTAC: new multivalent techniques for qualitative and quantitative copromicroscopic diagnosis of parasites in animals and humans". *Nature Protocols*, 5(3), 503-515.

Care4Dairy project: Developing Best practices for the Welfare of Dairy Cattle

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Abstract: In the absence of species-specific legislation for dairy cows, the development of guidelines is highly desirable also with a view to creating a more level playing field for EU producers. Care4Dairy is an EU funded project aiming to develop best practice guidance to go beyond good practice in a framework focusing on positive welfare for dairy animals, even where this is not yet common practice, thereby promoting really good lives for animals in accordance with societal values. The best practices will cover the whole cycle of production of a dairy farm, from the birth or introduction of animals until they leave the farm, and the first seven days of life after unweaned dairy calves enter a fattening farm. The best practices should consider the variety of farms in terms of sizes, designs, regional climates and economic models that exist in Europe. Activities related to the preparation for transport or the possible killing of animals on farm are also covered. The project adopts a farmer-centred approach with strong involvement of other stakeholders (e.g. as member of the Advisory Board and Reviewing Committee).

The consortium consists of five partners from an animal welfare science background, who are involved in EUR-CAW-Ruminants and Equines, and two partners specialised in applied research and bridging sciences with practices on animal welfare. The main deliverables of CARE4DAIRY are four best practice guidelines (for dairy calves, heifers and cows and end-of-career animals) together with a report addressing the dissemination strategy pillars for success.

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References

- JF Mee & LA Boyle (2020) Assessing whether dairy cow welfare is “better” in pasture-based than in confinement-based management systems, *New Zealand Veterinary Journal*, 68:3, 168-177, DOI: 10.1080/00480169.2020.1721034.
- Scientific Opinion of the Panel on Animal Health and Welfare on a request from the European Commission on the overall effects of farming systems on dairy cow welfare and disease. *The EFSA Journal* (2009) 1143, 1-38.
- Eurostat 2019 Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes OJ L 221, 8.8.1998.

Pilot investigation of the hibernation patterns of rescued brown bears (*Ursus arctos*) housed in sanctuaries

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Abstract: Hibernation is an adaptive behaviour of some cold-climate species¹. Brown bears are facultative hibernators² that, driven by environmental and physiological factors, go into a seasonal torpor during winter^{3,4,5}. Hibernation has been described for free-ranging brown bears^{3,4,5}, but this preliminary study is the first investigation of hibernation patterns in individuals under human care. Data were collected on 94 rescued, non-breeding, brown bears (*Ursus arctos*), 49 females and 45 males, aging from 2 to 43 years old, during the winter of 2020 (n=46), 2021 (n=48) and 2022 (n=89). The bears were housed in semi-natural enclosures in six FOUR PAWS sanctuaries (Ukraine, Bulgaria, Austria, Germany, Kosovo and Switzerland) with seasonal adaptations of husbandry. Caretakers recorded data using questionnaires. The number of hibernating bears was extracted for all years, and for 2021 also hibernation duration and continuity (number of days bears were seen out of the den), resources available (natural and human-made dens), and chosen den. Results showed that 91.3%, 91.7% and 86.5% of bears hibernated during 2020, 2021 and 2022, respectively. The duration and continuity most represented were 12 to 16 weeks (n=12) and zero days (n=12). Resources to dig natural dens or pre-dug dens were available in all enclosures, human-made dens available for 36 bears, and chosen by 27 bears. This study suggests that, when given the appropriate resources in cold winter climates, brown bears in captivity go into hibernation. The individual reasons for outliers not hibernating need to be investigated, as well as the potential of hibernation as a welfare indicator.

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References

- Geiser, F. Hibernation. *Current Biology* 2013, 23 (5), R188–R193. <https://doi.org/10.1016/j.cub.2013.01.062>.
- Krofel, M.; Špacapan, M.; Jerina, K. Winter Sleep with Room Service: Denning Behaviour of Brown Bears with Access to Anthropogenic Food. *J Zool* 2017, 302 (1), 8–14. <https://doi.org/10.1111/jzo.12421>.
- Wells, C. P.; Barbier, R.; Nelson, S.; Kanaziz, R.; Aubry, L. M. Life History Consequences of Climate Change in Hibernating Mammals: A Review. *Ecography* 2022, 2022 (6). <https://doi.org/10.1111/ecog.06056>.

4. Evans, A. L.; Singh, N. J.; Friebe, A.; Arnemo, J. M.; Laske, T. G.; Fröbert, O.; Swenson, J. E.; Blanc, S. Drivers of Hibernation in the Brown Bear. *Front Zool* 2016, 13 (1), 7. <https://doi.org/10.1186/s12983-016-0140-6>.
5. Delgado, M. M.; Tikhonov, G.; Meyke, E.; Babushkin, M.; Bespalova, T.; Bondarchuk, S.; Esengeldenova, A.; Fedchenko, I.; Kalinkin, Y.; Knorre, A.; Kosenkov, G.; Kozshechkin, V.; Kuznetsov, A.; Larin, E.; Mirsaitov, D.; Prokosheva, I.; Rozhkov, Y.; Rykov, A.; Seryodkin, I. V.; Shubin, S.; Sibgatullin, R.; Sikkila, N.; Sitnikova, E.; Sultan-gareeva, L.; Vasin, A.; Yarushina, L.; Kurhinen, J.; Penteriani, V. The Seasonal Sensitivity of Brown Bear Denning Phenology in Response to Climatic Variability. *Front Zool* 2018, 15 (1), 41. <https://doi.org/10.1186/s12983-018-0286-5>.

Animal neglect cases in Norway

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Abstract: Animal neglect can be categorised as failure(s) to provide animals with necessary food, water, grooming, sanitation, spatial and environmental conditions, protection from the elements, and relief of pain and suffering [1]. This is the most common form of animal cruelty, and it may be due to the stockperson's lack of knowledge, experience, motivation, empathy, or poor physical or mental health [2]. Animal neglect can be wilful and deliberate or unintentional, but the pain and suffering for the animals remain the same [1]. A new Norwegian Animal Welfare Act came into force in 2010, and the maximum sentence for serious violations increased from one to 3 years in prison. A neglect case was brought to the Supreme Court in 2016. All animals in a farm with 92 cattle were found dead due to thirst and starvation. The farmer was sentenced to 1 year and 10 months in prison. From 2021, all Norwegian police districts have units to investigate animal cruelty, which has led to an increased number of cases investigated for violating the Animal Welfare Act. In 2022, a farmer was sentenced to 1 year and 9 months in prison for severe neglect of 22 cattle. Another farmer was sentenced to 6 months in prison due to failure to provide a sheep flock with necessary food, water, supervision, sanitation and veterinary health care. A more systematic collaboration between veterinary surgeons, the police, the Norwegian Food Safety Authority, health care and advisory services is needed to detect and prevent animal neglect [2].

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References

1. Patronek, P.; Nathanson, J.N. Understanding Animal Neglect and Hoarding. In *Animal Maltreatment: Forensic Mental Health Issues and Evaluations*; Levitt, L., Patronek, G.J., Grisso, T., Eds.; Oxford University Press: New York, NY, USA, 2016; pp. 159-194.
2. Muri, K.; Moe, R.O.; Nesje, M. When humans cause animal suffering: the role of the veterinary surgeon. *Norsk veterinærtidsskrift* 2016, 4, 232-240.

Sleepless in stable – preliminary results on factors associated to suspected sleeping problems in horses

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Abstract: Very little is known about sleep disorders in horses, although several management factors may contribute to increased risk of disorder. To investigate possible risk factors, we conducted an international online survey to horse owners/caretakers with horses housed in individual pens. In our preliminary results, 1692 respondents answered the question whether they suspected their horse suffered from sleep disorders or not (yes/no), and the associations between suspected sleep disorder and management factors were investigated using χ^2 -tests. Of the horses suspected of having sleep disorders (POORSLEEPERS), 76.4% (42/55) showed problems in resting behaviours, compared to 11.9% (176/1473) of horses judged to sleep well (GOODSLEEPERS) ($p < 0.001$). In addition, 64.4% (58/90) of the POORSLEEPERS were >160 cm tall and 70% (63/90) were ≥ 13 years (732/1575) compared to 46.5% (732/1575) and 47.2% (754/1596) of GOODSLEEPERS, respectively ($p < 0.001$ for both). Of the POORSLEEPERS 31.4% (27/86) had observed to be injured during the night and 12.5% (11/88) had not observed rolling vs. 3.4% (54/1530) and 2.5% (40/1594) of GOODSLEEPERS, respectively ($p < 0.001$ for both). POORSLEEPERS were more common in hobby than sport use; 88.5% (69/78) vs. 70.2% (1024/1458) of GOODSLEEPERS ($p < 0.001$) and were currently suffering illnesses and/or trauma; 38.8% (31/80) vs. 14.6% (232/1589), respectively ($p < 0.001$). Medication was more common in POORSLEEPERS 11.1% (10/90) than in GOODSLEEPERS 5.2% (83/1597; $p = 0.03$). We conclude that several management and horse related factors appear to be associated with the suspected sleep disorder in horses. Further studies are needed to investigate their inter-relationship.

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A systematic review on appeasing pheromones in goats, sheep and wild ruminants

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Abstract: This paper aimed at systematically reviewing the scientific literature on appeasing pheromones in goats, sheep and wild ruminants. Literature search was conducted in March 2023, using the database Scopus with the following keywords: “goat” OR “sheep” OR “wild ruminants” OR “fallow deer” OR “deer” OR “mouflon” OR “roe deer” OR “reindeer” OR “wild Goats” AND “pheromone” OR “semiochemical” OR “appeasing substance”. Search provided 255 documents, of which 14 were excluded because they were not in English, 49 because they were reviews (23), book chapters (12), or documents other than articles (14). The remaining 192 documents (57 about wild animals) were manually checked for title and abstract, and 139 excluded because: 73 did not fit the topic, 65 were about sexual pheromones, 43 dealt with physiology or anatomy, and 5 with biomolecular genetics. Only 6 papers were focussed on mother-offspring recognition and bonding, and their content was reviewed [1–6]; however, appeasing pheromones were not mentioned. The present review found that studies on semiochemicals in goats, sheep and wild ruminants are mainly about sexual behaviour and “male effect”; instead, there is no published research on the effects of appeasing pheromones in those species. Animal appeasing pheromones are well investigated in other species and patented [7]. Several peer-reviewed publications have evaluated the bovine appeasing substance in production settings, such as weaning, feedlot entry, castration, transport to the slaughterhouse, and pre-weaning [8]. These results suggest extending research to other ruminants, such as goats, sheep and even wildlife.

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References

1. Burger, B.V.; Viviers, M.Z.; Le Roux, N.J.; Morris, J.; Bekker, J.P.I.; Le Roux, M. Olfactory Cue Mediated Neonatal Recognition in Sheep, *Ovis Aries*. *J Chem Ecol* 2011, 37, 1150-63, doi:10.1007/s10886-011-0020-7.
2. Baldwin, B.A.; Meese, G.B. The Ability of Sheep to Distinguish between Conspecifics by Means of Olfaction. *Physiol Behav* 1977, 18, 803-808, doi:10.1016/0031-9384(77)90187-1.
3. Romeyer, A.; Poindron, P.; Porter, R.H.; Levy, F.; Orgeur, P. Establishment of Maternal Bonding and Its Mediation by Vagino-cervical Stimulation in Goats. *Physiol Behav* 1994, 55, 395-400, doi:10.1016/0031-9384(94)90153-8.
4. Viviers, M.Z.; Burger, B. V.; Le Roux, N.J.; Morris, J.; Le Roux, M. Temporal Changes in the Neonatal Recognition Cue of Dohne Merino Lambs (*Ovis Aries*). *Chem. Senses* 2014, 39, 249-262, doi:10.1093/chemse/bjt075.
5. Lopes, A.K.C.; Araújo, J.F.; Peixoto, R.M.; de Sousa, A.L.M.; Lima, A.M.C.; Amaral, G.P.; de Vasconcelos, A.M.; Andrioli, A. Evaluation of Maternal-Filial Stress in a Dairy Goat Herd with Small Ruminant Lentivirus Infection in the Brazilian Northeastern Semi-arid Region. *J Vet Behav* 2021, 46, 54-61, doi:10.1016/J.JVEB.2021.07.012.
6. Booth, K.K.; Katz, L.S. Role of the Vomeronasal Organ in Neonatal Offspring Recognition in Sheep 1. *Biol Reprod* 2000, 63, 953-958, doi.org/10.1095/biolreprod63.3.953
7. Pageat, P. US6384252B1 - Animal Appeasing Pheromones - Google Patents Available online: <https://patents.google.com/patent/US6384252B1/en> (accessed on 14 March 2023).
8. Cappelozza, B.I.; Cooke, R.F. Administering an Appeasing Substance to Improve Performance, Neuroendocrine Stress Response, and Health of Ruminants. *Animals* 2022, 12, 2432. doi.org/10.3390/ani12182432

The French Reference Centre for Animal Welfare (FRCAW): missions, ressources and expertise work

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Abstract: Introduction. Legally provided for in the French Future Agriculture legislation and created in 2017 by the French Ministry of Agriculture and Food, the French Reference Centre for Animal Welfare (FRCAW) provides collective expertise and consolidated scientific and technical references to public authorities and economic and social actors, in order to improve the consideration of the welfare of animals under human care (farm animals, pets, captive wildlife). Applications. The FRCAW brings together top professionals in research, development and training in order to enhance and disseminate knowledge, innovation and know-how, thereby facilitating the integration of animal welfare into the design of sustainable farming systems, and to bring together all stakeholders involved in animal welfare. The FRCAW carries out different activities: 1. Run an information and documentation platform to improve the dissemination of knowledge, innovation and know-how and strengthen their practical application for the benefit of animals, 2. Provide scientific and technical support and expertise work to public authorities, professional organisations and NGOs, and identify knowledge gaps. Examples of expertise work carried out by the FRCAW: Canine educational practices and tools and their impact on animal welfare, Welfare of domestic carnivores at events, Stress assessment in mobile abattoirs, Pig environmental enrichment materials. The FRCAW work extends beyond France, with all resources being made available and disseminated in English, and with close collaborations with EURCAWs, other national reference centres in Europe as well as other animal health and welfare organisations and networks.

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Validation of the Familiar Human Approach Test to evaluate human-animal relationship in dairy goats at pasture

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Abstract: This study aims to validate a modified Familiar Human Approach Test (FHAT) originally proposed for sheep in extensive systems [1] to be used in dairy goats by checking its convergent validity with the Latency to the First Contact Test (Latency), developed and validated for dairy goats kept indoors [2]. The study was conducted in 18 farms in Piedmont (Italy). Latency was performed by unfamiliar and familiar (farmer) assessors during winter housing. FHAT was applied by the farmer during the grazing period at pasture; assessors (out of sight of the animals) evaluated the reaction of goats to the routine gathering of animals. Goats' reactions were used to classify farms (Avoidance – withdrawal from the farmer: $n=4$; Acceptance – no withdrawal from and no contact with the farmer: $n=7$; Approach – spontaneous approach with contact: $n=3$; Contact – >3 sec contact: $n=4$) and results of Latency were compared among classes of farms (Kruskall-Wallis test). Latency time was always higher in the classes without contact. However, differences among classes were not statistically different in response to the presence of the unfamiliar assessor (Avoidance: 161.5 ± 159.96 sec; Acceptance: 144.6 ± 122.35 sec; Approach: 77.3 ± 39.88 sec; Contact: 61.0 ± 67.38 sec; $P=0.631$), while statistical differences were found in response to the familiar assessor (Avoidance: 164.3 ± 114.83 sec; Acceptance: 115.6 ± 127.04 sec; Approach: 48.0 ± 40.95 sec; Contact: 7.8 ± 5.44 sec; $P=0.016$). Pairwise comparison highlighted statistical differences between Contact vs Avoidance ($P=0.003$) and vs Acceptance ($P=0.009$). Results suggest that FHAT could be promising for the evaluation of the human-animal relationship in dairy goats at pasture.

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References

1. AWIN (2015). AWIN welfare assessment protocol for sheep.
2. AWIN (2015). AWIN welfare assessment protocol for goats.
3. Celozzi, S.; Battini, M.; Prato-Previde, E.; Mattiello, S. Humans and Goats: Improving Knowledge for a Better Relationship. *Animals* 2022, 12, 1–33.

Innovative technologies for welfare assessment of sheep and goats at pasture in the Mediterranean area

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Abstract: Sensor technology allows real-time monitoring of animals, providing useful information to improve their welfare, health and productivity [1-3]. In the Mediterranean area, sensors could be used to evaluate issues caused by heat stress, pasture quality and predator attack. The application of this technology, however, presents an enormous challenge because components or sensors must be wearable, wireless, small, compact, strong, and resistant to extreme conditions in order to avoid failures and breakages [4]. The most used sensors monitor parameters such as behavior, heart rate, food intake, motor activity and spatial position of the animal. Research on grazing sheep have demonstrated that accelerometers, sensors inserted in collars or ear tags, can be used to precisely measure activities like feeding and ruminating. This technique could be utilized to create more sophisticated sensors that are helpful for automatically tracking feed consumption on large farms, which could help monitor animal welfare and help management practices [5-7]. The development of GPS technology has led to greater spatial precision and made it more feasible for farmers to utilize whole-herd monitoring systems. This technology is excellent for determining the location of small ruminants [8-10]. Sensors capable of recording the heart rate or ECG of sheep, placed on headbands or collars, can be used on pasture to assess various stress conditions, such as heat stress in the summer season or stress caused by the presence of predators [12, 13]. Despite promising results, most technologies have not yet reached a similar level of applicability as those introduced in intensive systems.

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References

1. Caja, G.; Castro-Costa, A.; Knight, C.H. Engineering to support well-being of dairy animals. *Journal of Dairy Research* 2016, 83, 136–147.
2. Krueger, A.; Cruickshank, J.; Trevisi, E.; Bionaz, M. Systems for evaluation of welfare on dairy farms. *Journal of Dairy Research* 2020, 87S1, 13–19.
3. Maltz, M. Individual dairy cow management: achievements, obstacles and prospects. *Journal of Dairy Research* 2020, 87, 145–157.
4. Caja, G.; Castro-Costa, A.; Salama, A.; Oliver, J.; Baratta, M.; Ferrer, C.; Knight, C. Sensing solutions for improving the performance, health and wellbeing of small ruminants. *Journal of Dairy Research* 2020, 87(S1), 34–46.
5. Almasi, F.; Nguyen, H.; Heydarian, D.; Sohi, R.; Nikbin, S.; Jenvey, C.J.; Halliwell, E.; Ponnampalam, E.N.; Desai, A.; Jois, M.; Stear, M.J. Quantification of behavioural variation among sheep grazing on pasture using accelerometer sensors. *Animal Production Science* 2022, 62, 1527–1538.
6. Mozo, R.; Alabart, J.L.; Rivas, E.; Folch, J. New method to automatically evaluate the sexual activity of the ram based on accelerometer records. *Small Ruminant Research* 2019, 172, 16–22.
7. Ikurior, S.J.; Marquetoux, N.; Leu, S.T.; Corner-Thomas, R.A.; Scott, I.; Pomroy, W.E. What Are Sheep Doing? Tri-Axial Accelerometer Sensor Data Identify the Diel Activity Pattern of Ewe Lambs on Pasture. *Sensors* 2021, 21, 6816.
8. Maroto-Molina, F.; Navarro-García, J.; Príncipe-Aguirre, K.; Gómez-Maqueda, I.; Guerrero-Ginel, J.E.; Garrido-Varo, A.; Pérez-Marín, D.C. A Low-Cost IoT-Based System to Monitor the Location of a Whole Herd. *Sensors* 2019, 19, 2298.
9. dos Reis, B.R.; Easton, Z.; White, R.R.; Fuka, D. A LoRa sensor network for monitoring pastured livestock location and activity. *Translational Animal Science* 2021, 5, txab010.
10. Plaza, J.; Sánchez, N.; Palacios, C.; Sánchez-García, M.; Abecia, J.A.; Criado, M.; Nieto, J. GPS, LiDAR and VNIR data to monitor the spatial behavior of grazing sheep. *Journal of Animal Behaviour and Biometeorology* 2022, 10, 2214.
11. Kitajima, K.; Oishi, K.; Miwa, M.; Anzai, H.; Setoguchi, A.; Yasunaka, Y.; Himeno, Y.; Kumagai, H.; Hirooka, H. Effects of Heat Stress on Heart Rate Variability in Free-Moving Sheep and Goats Assessed With Correction for Physical Activity. *Frontiers in Veterinary Science* 2021, 8, 658763.
12. Turini, L.; Bonelli, F.; Lanatà, A.; Vitale, V.; Nocera, I.; Sgorbini, M.; Mele, M. Validation of a new smart textiles biotechnology for heart rate variability monitoring in sheep. *Frontiers in Veterinary Science* 2022, 9, 1018213.

Blood parameters evaluated in sheep underwent to three different pasture management

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Abstract: Heat stress (HS) results from the exposure to adverse climate conditions and has a direct impact on welfare, health, and production [1]. The aim was to evaluate the influence of different pasture management on some blood parameters in sheep from 3 dairy sheep farm (A, B, C) (Institutional Animal Care and Use Committee, University of Pisa, prot. N: 11/2021 of 19/03/2021). Pasture of Farm A (FA) had no shade and no drinking water, farm B (FB) had water sources, but no shade and farm C had both. Based on clinical examination, 20 healthy sheep were randomly chosen from each farm (total = 60). Blood samples were monthly collected from March to June (T1-4) to evaluate red blood cell count (RBC), hematocrit (HCT), hemoglobin (HGB), urea, creatinine and total protein (TP). The average temperature–humidity index (THI) was recorded. A linear mixed model was used to evaluate the difference in blood parameters throughout T1 to T4 between Farm A, B, C. THI resulted as “no stress” (T1 and T2), “severe HS” (T3) and “extreme severe HS” at T4. The highest RBC, HCT, HGB, urea and TP levels were at T4, while the lowest at T1 for all Farms ($p < 0.001$). FC sheep had always the lowest RBC, HCT, HGB, urea and TP. Higher values of RBC, HCT, HGB and TP in FA and FB may be related to a dehydration status occurring in animals under heat stress conditions [2-4]. Urea may also represent potential markers for HS [1, 5].

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References

1. Sejian, V.; Indu, S.; Naqvi, S.M.K. Impact of short term exposure to different environmental temperature on the blood biochemical and endocrine responses of Malpura ewes under semi-arid tropical environment. *Indian Journal of Animal Science* 2013, 83, 1155-1159.
2. Srikandakumar, A.; Johnson, E.H.; Mahgoub, O. Effect of heat stress on respiratory rate, rectal temperature and blood chemistry in Omani and Australian Merino sheep. *Small Ruminant Research* 2003, 49, 193–198.
3. Al-Haidary, A. Physiological responses of naimey sheep to heat stress challenge under semi-arid environments. *International Journal of Agriculture and Biology* 2004, 6, 307-309.
4. Rana, M.S.; Hashem, M.A.; Sakib, M.N.; Kumar, A. 2014. Effect of heat stress on blood parameters in indigenous sheep. *Journal of the Bangladesh Agricultural University* 2014, 12, 91–94.
5. El- Shahat Attia, N. Physiological, hematological and biochemical alterations in heat stressed goats. *Benha Veterinary Medical Journal* 2016, 31, 56-62.

Analyses of reasons for referral visits to an animal behavior practice in France and impact of the COVID-19 lockdown

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Abstract: Introduction. Behavioral concerns are one of the main causes of surrender and euthanasia of pets (1,2). Veterinarians, especially behaviorists, play an important role in advising owners. Interestingly, there are discrepancies between behavioral complaints when questioning owners, analyzing generalist or behavioral veterinary consultations (e.g. 3,4,5). We aimed at analyzing behavioral complaints over an extended period for referral consultations, but also at determining whether the COVID-19 lockdown had an effect on complaints. Methodology. Data were collected from the behavioral referral logbook of the National Veterinary School of Alfort. Complaints categorised for cats and for dogs, from September 2014 to July 2022, allowing a comparison before and after lockdown. Chi-square tests were made to compare years. Results. Out of the 2166 consultations included, cats represented 25.2% of the cases and dogs 74.8%; proportions were stable over years. The main behavioral issues in dogs were aggression (22.5%) and anxiety/fear/phobia (14.4%). Mandatory behavioral assessments (French law for dangerous and biting dogs) represented 22.1% and significantly increased after lockdown ($p>0.05$). Other complaints were excessive barking (5.1%), stereotypies (3.5%), inappropriate elimination (3.4%) and destructions (2.9%). 25.9% of behavioral consultations for cats were stereotypies (excessive licking or itching), the most prevalent complaint, followed by inappropriate elimination at 22.9% and aggressions at 19.8%. Other complaints were anxiety/fear/phobia (4.5%) and meowing (3.8%). Stereotypies increased significantly after lockdown ($p>0.05$). Conclusion. Lockdown seemed to change behavioral complaints, presumably related to biting for dogs and repetitive behaviors for cats. Lockdown is suggested to have an impact on pets' welfare, though further studies are needed.

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References

1. Cannas S., Talamonti Z., Mazzola S., Minero M., Picciolini A., Palestrini C. (2018). Factors associated with dog behavioral problems referred to a behavior clinic. *Journal of Veterinary Behavior*. 24, 42–47. DOI 10.1016/j.jveb.2017.12.004.
2. Yu Y., Wilson B., Masters S., Van Rooy D., Mcgreevy P. (2021). Mortality Resulting from Undesirable Behaviours in Dogs Aged Three Years and under Attending Primary-Care Veterinary Practices in Australia. *Animals*. 11, 493. DOI 10.3390/ani11020493.
3. Bowen J., García E., Darder P., Argüelles J., Fatjó J. (2020). The effects of the Spanish COVID-19 lockdown on people, their pets, and the human-animal bond. *Journal of Veterinary Behavior* 40, 75–91. DOI 10.1016/j.jveb.2020.05.013.
4. Fatjó J., Amat M., Mariotti V., Ruiz-De-La-Torre, J.L., Manteca X. (2007). Analysis of 1040 cases of canine aggression in a referral practice in Spain. *Journal of Veterinary Behavior*. 2, 158–165. DOI 10.1016/j.jveb.2007.07.008.
5. Fatjó J., Ruiz-De-La-Torre, J.L., Manteca X. (2007). The epidemiology of behavioural problems in dogs and cats: A survey of veterinary practitioners. *Animal Welfare*. 15. DOI 10.1017/S0962728600030268.

A multidisciplinary approach to patient care and wellbeing: the unusual case of the vocalizing cat

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Abstract: A 13-year-old spayed female domestic shorthair cat was examined because she was vocalizing during the night, along with relentless walking, severely disturbing the owner's sleep. Cat was already receiving treatment for a well- documented hyperthyroidism, pharmacologically under control. Fearing a brain pathology, a total body computed tomography scan was performed and unexpectedly an adrenal tumour was revealed. It was strongly advised that the cat have an adrenalectomy, but the owner declined and she would much want to relinquish ownership. A behavioural consultation was suggested as the last possibility. During the consultation, the owner described also a typical sexual behavioural pattern: the cat was mounted by the cohabiting cat and she was friendlier with the conspecific. Urine markings was frequently observed. Endocrine tests revealed normal serum levels of cortisol but increased basal concentrations of testosterone and progesterone and it was suspected a sex- hormones producing adrenal tumour. The necessity of the adrenalectomy was enforced by the possible link with the behaviour and finally, the cat underwent surgery, performed without complications. The histopathology revealed an adrenocortical carcinoma. Functional non-cortisol-producing adrenal tumours are exceedingly rarely reported in cats¹, but is well known that adrenal gland tumours can produce a variety of hormones other than cortisol². Soon after the surgery, sexual behavioural pattern and friendly social behaviour ceased. After two week, sex hormone levels were found to be within normal range for a desexed female cat. If a spayed cat exhibits changes in social behaviour, adrenocortical neoplasia should be considered in the differential diagnosis.

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VETeris guidelines: a One Health/One Welfare approach to elderly-animal bond

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Abstract: In 2020, there were 727 million people aged over 65 in Europe and they are expected to more than double by 2050 [1]. European policies for elderly people aim to improve active ageing and to facilitate access to care and social services to reduce loneliness and to delay the occurrence of chronic physical and mental health diseases, which are the main costs for European healthcare systems [2]. Therefore, healthcare and social strategies need to focus on protective factors like quality of life, active ageing, empowerment and improvement in social relationships [3]. Among these strategies, the human-animal bond is recognised to play a key role [4]. In Italy, some legislative actions have been taken to value this relationship through National Guidelines for Animal Assisted Interventions (AAI) [5], which regulate the suitability of animals involved, their health and welfare monitoring, operating procedures and the assessment of AAI program results. Moreover, a specific law to support the role of pets in elderly life is discussed nowadays in Parliament [6].

However, there is a lack of specific guidelines for human and animal professionals to manage effectively the human-animal bond as a powerful tool to improve the elderly quality of life. In this framework, a multidisciplinary network of experts including geriatrics, veterinarians, animal handlers and healthcare professionals (VETeris, from Latin “vetus” = old) has developed guidelines with a One Health/One Welfare approach to guarantee an integrated, individually-tailored model of care and social support focused on the role of the human-animal bond for elderly.

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References

1. United Nations. “World Population Ageing 2020 Highlights”. Available online: https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/files/documents/2020/Sep/un_pop_2020_pf_ageing_10_key_messages.pdf (download: 10/03/2023)
2. WHO, Regional Committee for Europe Sixty-second session. Strategy and action plan for healthy aging in Europe, 2012-2020. Available online: https://www.euro.who.int/__data/assets/pdf_file/0008/175544/R_C62wd10Rev1-Eng.pdf (download: 10/03/2023)
3. McClain, J.; Gullatt, K.; Lee, C. “Resilience and Protective Factors in Older Adults” Graduate Master’s Theses, Capstones, and Culminating Projects. 2018. <https://doi.org/10.33015/dominican.edu/2018.OT.11>
4. Enders-Slegers, M-J; Hediger, K. Pet Ownership and Human–Animal Interaction in an Aging Population: Rewards and Challenges. *Anthrozoös*, 2019, 32(2), 255-265. <https://doi.org/10.1080/08927936.2019.1569907>
5. Italian Ministry of Health. Interventi Assistiti con gli Animali (I.A.A.). Linee Guida; Repertorio Atti n.: 60/CSR del 25/03/2015. Available online: http://www.salute.gov.it/imgs/C_17_opuscoliPoster_276_allegato.pdf
6. Atto Senato n. 506 XIX Legislatura. Available online: https://www.senato.it/leg/19/BGT/Schede/Ddliter/testi/56516_testi.htm (download: 10/03/2023).

What cat caregivers don’t tell you ... A comparison between survey responses and home videos of cat-cat interactions

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Abstract: Domestic cats are increasingly popular as companion animals [1], but behavioural problems are often reported [2, 3], especially in multicat households [4]. Social tension is a common stressor [5], so understanding intercat interactions and their dynamics is crucial. Nevertheless, research in the home setting is rare. As caregivers witness their cats’ behaviour on a daily basis, they are a potentially important source of information. Concerns over caregiver knowledge and subjective interpretations can lead to criticisms of bias in the information they provide, especially if only survey data are collected [6, 7]. This study examined the reliability of caregiver reporting by comparing survey answers with behaviours observed in home videos collected after the survey was completed. The occurrence of five cat-cat behaviours (head rubbing, allogrooming, sleeping in physical contact with each other, tail up greetings and social play) was examined in 42 two-cat households using 210 survey answers and 775 videos. Of the 42 caregivers, 14 (33.3%) failed to reliably report the occurrence of at least one of the surveyed cat-cat behaviours. For behaviours that were seen on camera, 23.8% of caregivers (10/42) responded that their cats did not show these interactions and 9.5% (4/42) reported that they did not know whether or not their cats interacted in this way.

These results are a conservative estimate of the magnitude of error in caregiver reports, and their implications need to be considered in future research that depends on caregiver report, as well as clinical assessments in behavioural medicine.

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References

1. FEDIAF. Facts & Figures 2021. Available online: <https://europeanpetfood.org/about/statistics/>. (Accessed on 16 February 2023).
2. Sandøe, P.; Nørspang, A.P.; Forkman, B.; Bjørnvad, C.R.; Kondrup, S.V.; Lund, T.B. The burden of domestication: A representative study of welfare in privately owned cats in Denmark. *Anim. Welf.* 2017, 26, 1-10.
3. Wright, J.C.; Amos, R.T. Prevalence of house soiling and aggression in kittens during the first year after adoption from a humane society. *J. Am. Vet. Med. Assoc.* 2004, 224, 1790-1796.
4. Ramos, D. Common feline problem behaviors: Aggression in multi-cat households. *J. Feline Med. Surg.* 2019, 21, 221-233.
5. Amat, M.; Camps, T.; Manteca, X. Stress in owned cats: behavioural changes and welfare implications. *J. Feline Med. Surg.* 2016, 18, 577-586.
6. Taylor, K.D.; Mills, D.S. The development and assessment of temperament tests for adult companion dogs. *J. Vet. Behav.* 2006, 1, 94-108.
7. Hall, N.J.; Wynne, C.D.L. The canid genome: Behavioral geneticists' best friend? *Genes Brain Behav.* 2012, 11, 889-902.

Effect of enrichment on the behaviour of Binturong (*Arctictis binturong*) in captivity

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Abstract: There is a paucity of knowledge regarding the binturong's (*Arctictis binturong*) behavior in captivity, which L. Abra (2010) highlight. This may disadvantage the welfare of this species in captivity. The present preliminary study aimed to explore the effects of putative enrichment provision on the behavior of a pair of binturongs (Charly, a 15-year-old male, and Moldava a 10-year-old female) in a zoological park. The putative enrichment consisted of a changing composition of at least one of the following: mirrors, gibbons' bedding, digging boxes, spices, blankets, hammock, rope, suspended bucket bed, foraging devices. The animals were observed, using instantaneous scan sampling for 12 hours during 6 different days. Generalized estimated equations (with Bonferroni corrected pairwise comparisons) were run on behavioral data with suitable distribution, with time of day (morning/afternoon), presence of enrichment (presence/absence), the animal (female/male) and the interactions/time of the day*animal and enrichment*animal in the model as predictors, and observations as entries (Grisa et al., 2013). Although the overall active behaviour increased when the enrichment was present, there was a significant difference between the male and female animal ($p=0.007$), with the male binturong resting more when environmental enrichment was present ($p=0.003$). Enrichment caused relaxed/resting without focused attention on anything ($p=0.04$). No other effects of enrichment were found. There is need for more research on the behavior and welfare of lesser known/iconic species in zoos.

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References

- Abra, L. (2010). Notes on the development and behavior of two Binturong *Arctictis binturong* litters born at Taronga Zoo, Sydney. *International Zoo Yearbook*. 44. 238-245.
- Grisa, R.; Bertelé, M.; Vaglio, S.; Spiezio, C. (2013). A therapeutic environmental enrichment program for managing pathological behaviour in the fossa (*Cryptoprocta ferax*). *J. Zoo Aquarium Res* 1, 41-43.

A qualitative exploration of the perception of fear and frustration in dogs and their differentiation by clinical animal behaviourists

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Abstract: Fear and frustration are two emotions which frequently contribute to problem behaviour cases in practice [1]. These emotions present an important diagnostic challenge for the clinical animal behaviourist as they may present similarly [2], but potentially require different treatment approaches in order to address the behaviour of concern most effectively. Although diagnostic frameworks have been proposed (e.g. [3]) it is largely unknown how behaviourists determine an inferred emotional state. Therefore this study used qualitative methods to explore how behaviourists conceptualise, recognise and differentiate “fear” and “frustration” in dogs. Semi-structured interviews of ten behaviourists from the Fellowship of Clinical Animal Behaviourists (FABC) were used to gather information for a thematic analysis of how they recognised and differentiated fear and frustration in dogs. Although participants perceived fear and frustration as negative affective states which lead to changes in an animal’s behaviour, there was little consensus on the definition or identification of these emotions. The use of hypothesis-driven falsification for diagnosis was highly variable with individual assessment processes often characterized by tautology, intuition, circular reasoning and confirmation bias indicating a lack of a scientifically consistent process. A diagnosis was typically based on professional judgment, amalgamating information on interpretation of communicative signals, motivation, learning history, breed, genetics and temperament. Given the lack of consensus in the definition of these states, it is clearly important that authors and clinicians define their interpretation of key concepts, such as fear and frustration, when trying to communicate with fellow scientists.

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References

1. Mills, D.; Dube, M. B.; Zulch, H. Stress and Pheromonotherapy in Small Animal Clinical Behaviour; 2013. <https://doi.org/10.1002/9781118702642>.
2. Lenkei, R.; Alvarez Gomez, S.; Pongrácz, P. Fear vs. Frustration – Possible Factors behind Canine Separation Related Behaviour. *Behavioural Processes* 2018, 157, 115–124. <https://doi.org/10.1016/j.beproc.2018.08.002>.
3. Overall, K. L. *Clinical Behavioral Medicine for Small Animals, Illustrated.*; Mosby, 1997.

Are cat caregivers successful at evaluating emotional states of their own cats? Preliminary results

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Abstract: In recent years, the number of studies focusing on the relationship between humans and animals considerably increased. For a healthy and reliable relationship, it is crucial for caregivers to correctly interpret the emotional states of their pets. This study aims to investigate the ability of caregivers to evaluate the emotional state of their cats and, further, to determine which behavioral signs are considered in emotional assessment. A total of 29 cat caregivers participated in the study. Caregivers recorded a video documenting a five-minute period from the moment they entered the house after a normal work day. All video recordings were initially evaluated by the expert panel to assess emotional states and behaviors of the cats. Caregivers were asked to evaluate their own cats in the recorded videos. Between cat owners and expert evaluation, a high consistency rate (73.68 %) was detected regarding emotional states of the cats. Less than half of the caregivers (42.10 %) chose the same behavioral labels with the expert panel. General body posture was the most frequently reported body language sign in emotional/behavioral assessment by cat caregivers (84.21 %). The number of cat owners who reported that tail movements (66.67 %) were the main criteria for their emotional/behavioral assessment. was more than those who reported tail position (21.05 %). This pilot study shows that caregivers are generally successful at assessing their cats' emotional states although their interpretation on behavior may not be correct. Anthropomorphic approach can be the main reason for different judgements on behavior.

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References

1. Pickersgill, O., Mills, D. S., & Guo, K. (2023). Owners' Beliefs regarding the Emotional Capabilities of Their Dogs and Cats. *Animals*, 13(5), 820.

Table of contents

Organizing committees	2
Welcome	3
Sponsors	4
Affenzeller, Nadja	5
Aillaud, Mathilde	6
Alvarado-Lopez Jesús Emiliano	6
Arhant, Christine	7
Ashall, Vanessa	7
Asproni, Pietro	8
Atilgan, Durmus	9
Bacon, Heather	10
Balusikova, Terezia	11
Barry, Conor	12
Battedou, Chloe	13
Belà, Benedetta	14
Ben-Dov, Dganit	15
Berteselli, Greta Veronica	16-17
Bienboire-Frosini, Cécile	18
Bleuer-Elsner, Stephane	19
Borrelli, Carmen	20
Brandt, Ida P. J.	22
Calderón-Amor, Javiera	22
Codecasa, Elisa	23
Colic, Ilse	24
Contalbrigo, Laura	24
Copelotti, Emma	25
Corridan, Claire	26
Costas, Xiana	27
Cozzi, Alessandro	28
Dai, Francesca	29
De Briyne Nancy	29
Delanoeije, Joni	30
Diederich, Claire	31
Diverio, Silvana	32
Driant, Marine	32
Everaert, Zoë	33
Felici, Martina	34
Flageollet, Lucie	34
Fletcher, Kate	35
Girault, Ciska	35

Göransson, Lina	36
Guillon, M.A.	37
Gunnarsson, Stefan	38
Habermaass, Verena	38
Hämäläinen, Mira	39
Hannes, Joerg	40
Harlander, Alexandra	40
Helsly, Marylou	41
Hepple, Sophia	42
Houpt, Katherine	42
Isparta, Sevim	43
Jahn, Katrin	44
Jonckheer-Sheehy, Valerie S.M.	45-46
Kapteijn, Chantal	47
Kenny, Jennifer	48
Kerman, Kaan	48
Köböl, Boglárka	49
Korpivaara, Mira	50
Kwik, Jenthe	50
Lamontagne, Angélique	51
Landi, Alessandra	52
Larsen, Cecilie W.L.	53
Lindstedt, Jenni	53
Louis-Maerten, Edwin	54
Luna, Daniela	55
Magalhães-Sant'Ana, Manuel	56
Manenti, Isabella	57
Martelli, Giovanna	58
McCulloch, Steven P.	59
Meers, Lieve L.	60-61
Mengoli, Manuel	62
Michelazzi, Manuela	63
Muri, Karianne	64
Normando, Simona	65
Osella, Maria Cristina	66-67
Paganelli, Aurora	67
Pearson, Gemma	68
Pérez Fraga, Paula	69
Pesenti Rossi, Gaia	70
Piotti, Patrizia	71
Plitman, Liran	72
Ramon-Perez, Angela	72
Reifler, Laura	73-74
Ricci, Eva	74-75
Riggio, Giacomo	76-77
Roccaro, Mariana	77
Sacchettino, Luigi	78
Salari, Federica	79
Salden, Sofie	80
Soares Pereira, Joana	81
Sobrero, Lucia	82

Sossidou, Evangelia N.	82
Stagni, Elena	83
Stubsjøen Solveig, Marie	84
Suomala, Heli	85
Tebano, Gabriele	85
Tiret, Agnès	86
Torsiello, Benedetta	87
Turini, Luca	88-89
Tusseau, Ninon	90
Uccheddu, Stefania	91
Ungar, Andrea	91
Van Belle, Morgane J.R.	92
Walsh, Elizabeth Ann	93
Wilson, Beverley M.	94
Yildirim, Tolga	95

