VET nuus•news

Mei / May 2026

The Monthly Magazine of the SOUTH AFRICAN VETERINARY ASSOCIATION
Die Maandblad van die SUID-AFRIKAANSE VETERINÊRE VERENIGING



THEME

Disaster Management

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Venue: Johannesburg Country Club
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CPD Course: Animal Research Ethics
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Info: https://scientificveterinaryconsulting.com/courses/essence-of-the-sans-10386-2021-online-short-course/

May 2026

Beyond Basics: Mastering the Cardio-respiratory Patient: A Structured Clinical Approach
11 - 12 May
Venue: Premier Hotel, Midrand, Gauteng
Info: https://vetlink.co.za/beyond-basics/

Eastern Cape and Karoo Branch of SAVA Congress
15 – 16 May
Venue: Halyards Hotel & Spa, Port Alfred
Info: Vetlink on https://vetlink.co.za/eastern_cape_and_karoo_branch-2026/

KwaZulu-Natal Branch of the SAVA Congress
30 – 31 May
Venue: San Lameer Resort Hotel & Spa
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13 - 15 April 2027

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01-04 June
Venue: STIAS – Stellenbosch
Info: https://tcs2026.com/

NVCG Bush Break
06-07 June
Venue: Skukuza, Kruger National Park
Info: Vetlink:
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RuVASA Congress 2026
08 - 10 June
Venue: Champagne Sports Resort, Drakensberg, KZN
Info: https://vetlink.co.za/ruvasa-congress-2026/

July 2026

56th Annual SASAS Congress
07 - 09 July
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Info: https://www.sasascongress.co.za/

SAVA Eastern Free State Congress
10-11 July
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Integrative Veterinary Medicine Conference
31 July - 02 August
Venue: Protea Hotel, Stellenbosch
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31 August – 02 September
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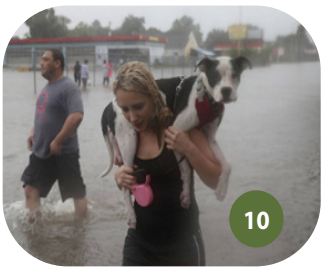
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A Month of Engagement, Advocacy and Global Veterinary Collaboration



Dear members,

The past month has once again reminded us of the breadth and intensity of the work facing the veterinary profession in South Africa. From disease control and regulatory engagement to international representation, SAVA has remained actively involved in matters that affect our members, our profession, animal health and welfare, public health and the sustainability of veterinary services.

This has been an extremely busy time for the VetHouse team and the Board. I would like to thank the Board of RuVASA and the leadership of the Wildlife Group for the extra hours they have put into engaging on key Foot and Mouth Disease regulatory matters.

Their efforts have helped to ensure that the profession remains appropriately engaged and that veterinary expertise is meaningfully considered in key discussions.

More importantly, they have helped to ensure that we continue to play an objective role in aligning the scientific and technical aspects of disease control with value-chain realities, to improve implementation and compliance.

A major focus during this period has been our response to the Foot and Mouth Disease pre-emptive vaccination scheme document. The approach taken by SAVA was that vaccination must be implemented within a legally sound, scientifically defensible and practically workable framework.

SAVA has therefore engaged constructively but firmly with the National Department of Agriculture to ensure that any proposed scheme respects the role of veterinarians, aligns with the relevant regulatory framework, and strengthens rather than fragments the national disease control response.

On the international front, SAVA participated in the International Veterinary Officers Coalition and the World Veterinary Association Congress. These platforms provided valuable opportunities to engage with veterinary leaders from across the world, share South Africa's perspectives, and learn from the experiences of other countries facing similar pressures. Many of the issues discussed internationally, such as workforce sustainability, transboundary animal diseases, antimicrobial stewardship, One Health, access to veterinary services and the role of veterinarians in building resilient food systems, are directly relevant to our local context.

During the IVOC meeting, held from 18 to 19 April 2026, it was clear that many of the challenges presented by member countries remain similar. Shortages and the uneven distribution of veterinarians remain key challenges across many countries. Some member countries are piloting changes in veterinary training that place greater emphasis on practical exposure alongside theoretical learning, with practices being incentivised to accommodate veterinary students.

This also includes opportunities for foreign-trained veterinarians to gain experience before sitting for board or licensing examinations in the respective countries. However, concerns were raised that an overreliance on this model may create challenges, particularly where harmonisation of training standards and regulatory requirements is still needed.

The mental health and wellness of veterinarians remain high on the priority list of concerns. Various countries presented wellness programmes that include counselling, mentorship and shared activities.

In countries where a "federal" system is used to regulate veterinary education and practice, alignment and harmonisation remain ongoing challenges. In the United States, this is further complicated by the number of institutions offering veterinary education across different states.

The regulation of para-veterinary professionals and lay persons performing veterinary-related work also remains a challenge, particularly in larger and more sparsely populated countries.

In this regard, South Africa's efforts and achievements in regulating para-veterinary professions are commendable and were provided as an important point of reflection in these discussions.

The member countries conducted a further benchmarking exercise on various aspects of the profession, ranging from the structure of veterinary associations and the veterinary workforce to practice ownership.

Other areas of concern included the regulation and availability of pharmaceuticals for veterinary use.

Member countries are addressing these issues in different ways, ranging from legislative changes, political lobbying and engagement with industry.

Discussions on member value propositions and fee structures leaned towards increasing expectations for individual member value, such as the provision of professional liability insurance and assistance in various practice-related areas. On fees, high corporate ownership has led to the development of models that incentivise large corporates to pay for veterinarians in their employ at preferential rates.

Trends in the use of artificial intelligence in veterinary practice were also discussed, including an insightful presentation on the pros and cons of its use in diagnostics. Overall, the interactions were informative and valuable.

The World Veterinary Association Congress was well attended, and there were no major issues arising from the AGM. The papers provided were of high quality, and a number of interesting AI solutions in the intensive pig and poultry industries are worth exploring.

This past month has also been an exciting period as the Board, together with SAVETCON, has resumed planning for the SAVA Congress next year.

We are looking forward to a well-attended congress and encourage members, groups and branches to participate fully in the programme and to save the date: 13 to 15 April 2027, somewhere in Gauteng!

As part of formalising SAVA's engagement with various bodies, the SAVA Board held a meeting with the Alternative Veterinary Forum, represented by Drs Jan Basch and Ockert Botha. Various members from both parties could not attend the meeting due to technical difficulties and other issues.

Despite this, a fruitful meeting was held, during which the AVF presented its structure, objectives and short-term project focus areas. These are under consideration and will be further discussed at the next Board meeting.

In May, we are looking forward to further engagement with SAHPRA and SAVA's participation in a regulatory technical forum working group.

The function of this forum is to serve as a communication platform within its scope, including the following areas:

- Guidelines and regulations — regional, continental and international;
- New circulars and directives;
- Medical devices and IVDs;
- Clinical trials;
- Pharmacovigilance;
- Complementary medicines;
- Veterinary medicines;
- Orthodox medicines;
- Radiation control; and
- Any other topic deemed necessary.

Currently, there is a radiation control regulatory proposal by SAHPRA. At this stage, these issues do not seem to affect veterinarians directly, but they are likely to impact larger industry players.

SAVA has also recently reviewed and released its position statement on non-therapeutic tail docking in canine puppies. At the recent FEDCO meeting, it was agreed that continued engagement with stakeholders on this matter should take place.

I would like to thank the members, branches, groups and committees who continue to contribute their time, expertise and energy to these important processes. Much of this work happens quietly and often under significant pressure, but it is essential to ensuring that the profession has a clear, credible and respected voice.

Groetnis,

Dr. Ziyanda Majokweni – Qwalela

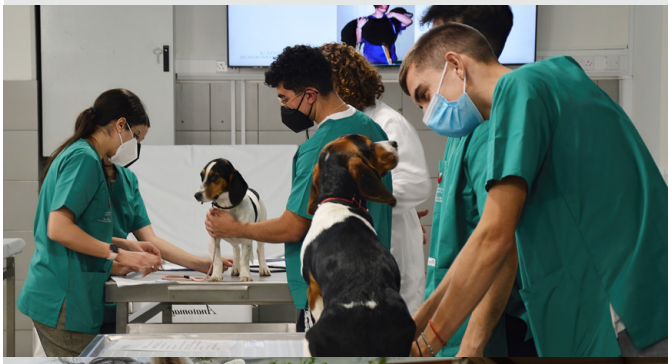
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Editor's notes / Redakteurs notas

Except for some light squeaking in the room, it was unnoticeable, but looking out the window, the swaying of buildings was remarkable. Japan is so used to earthquakes and prepared that there was no hoo-ha about it. A message from somebody in South Africa made us attend. It was quite the talking point for the foreigners like us.



International collegial interaction is something that can put a lot of domestic issues into perspective. After just returning from the World Veterinary Association's World Congress in Janan (the one we presented two years ago), can it be that long?) It has shown again that international congresses are very good for gaining knowledge (and those pesky CPD points), but even more importantly, to talk to colleagues from different countries (if you share a common language) for perspective and understanding of one's own issues. Issues like funding, leadership, willing to make a change seem to be universal topics, and without becoming a pity party, ideas and workarounds can be enlightening to both parties. But, being in a completely unfamiliar culture and a very uncomfortable time zone, adding to the long flight, it surely takes you away from home and helps you enjoy what the country has to offer. A very enlightening experience indeed. The day we booked into the hotel, there was a 7.5 magnitude earthquake off the shore of Japan, but much higher to the south.



The International Animal Disaster Preparedness Day is commemorated on the 8th of May. I asked my beloved husband (who is a bit of a buff on disaster management) to compile an article on the topic. The first concept to understand is the definition of a disaster. In that light, the current Foot-and-mouth outbreak fits snugly into that definition. A couple of mitigating steps are given and can be implemented throughout the sphere of veterinary application in South Africa (and the world). It not only applies to pets, but also to all animals that can suffer under disasters. Natural disasters in South Africa are usually isolated to smaller areas and handled as such, but with climate change and more erratic weather behaviour, it may change, even though we hope it does not. Read the article and discover some gems to apply at work and at home.

Disasters (and disease outbreaks like foot-and-mouth, avian influenza, African swine fever and the rest) may lead to mass euthanasia, or depopulation, as the articles have shown by Veterinarians and veterinary-related professions. I picked a couple of articles related to the topic. It may put some emotions and feelings into perspective. A very interesting article I picked up reports on a research study on the veterinarians' thoughts and attitudes towards assisted dying in humans. A very interesting parallel indeed.

The other date in May that is always of significance to me is International Bee Day. It coincides with my birthday, and I have adopted the bee as a super special animal. A year or so ago, I wrote on the correlation of a bee and the 10c coin. I still collect and treasure them. May they both be of significance to you.

If you think that is an insignificant principle, spend a night in a warm room with a mosquito. I hope that you have a good May and enjoy the cooler weather, although it looks like the weather is a little disturbed in some areas.

Andriette



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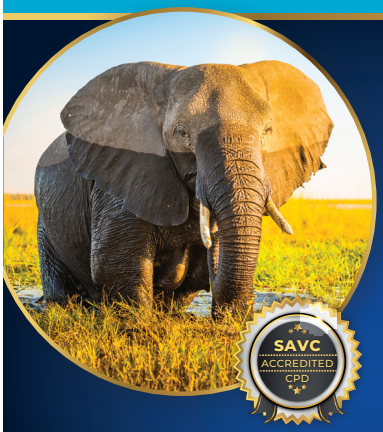
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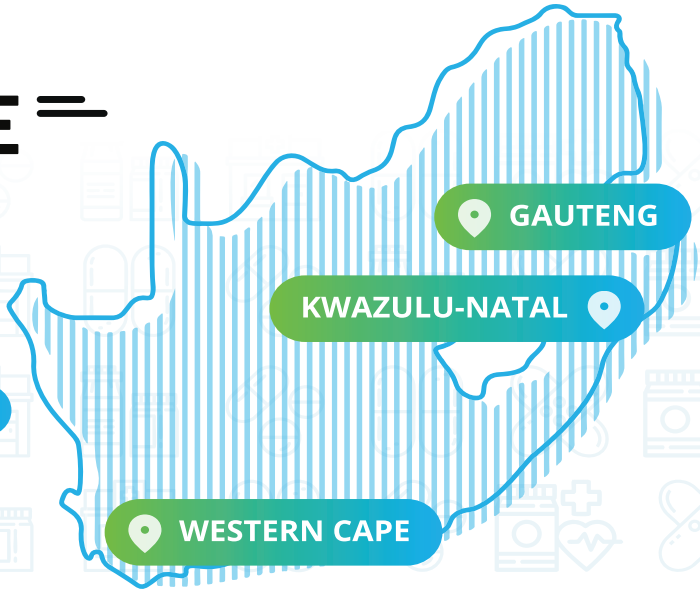
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Animal Disaster Preparedness and Risk Reduction: A Veterinary Systems Approach to Prevention, Preparedness, and Resilience

Dr Paul van der Merwe BVSc; BVSc(Hons); MMedVet(Fer). Director One Health Consulting

Abstract

The escalation in frequency, scale, and complexity of disasters presents a systemic threat to animal health, public health, and socio-economic stability. Despite the recognised but often overlooked role of veterinary services within disaster management frameworks, preparedness remains inconsistent and frequently reactive. This article advances a structured, systems-based approach to animal disaster preparedness, integrating principles of disaster risk reduction, biosecurity, contingency planning, and capacity development within a One Health context. It argues that effective disaster management is contingent not on planning alone, but on institutional coherence, operational readiness, and sustained capacity across all levels of the system. The article proposes a consolidated framework for veterinary disaster preparedness that emphasises prevention, early warning, coordinated response, and recovery, supported by continuous training and intersectoral integration. The central thesis is that resilience is an outcome of deliberate system design, not post hoc response.

Introduction

The United Nations Office for Disaster Risk Reduction defines a disaster as a serious disruption of the functioning of a community or society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

The risks of disasters are no longer episodic but structural. The convergence of climate change, ecological degradation, intensification of animal production systems, and increased human–animal-environment interface has shifted disaster exposure from isolated events to persistent systemic risks. Animals occupy a critical nexus within this risk landscape. Their vulnerability during disasters has direct implications for public health, particularly through zoonotic pathways, food security, agricultural continuity and economic stability at local, national and even international levels, as was evident during the Covid-19 pandemic.

Veterinary services are therefore not peripheral actors in disaster management; they are core to its effectiveness. However, current preparedness remains uneven, frequently reactive, and insufficiently integrated into broader disaster management systems.

This article advances a structured, policy-aligned framework for veterinary disaster preparedness, grounded in three interdependent domains:

- Risk reduction and prevention
- Preparedness and contingency planning
- Capacity and systems integration

The Disaster Risk Context: From Event-Based to Systemic Risk

The Changing Nature of Disaster Risk

Disasters affecting animal systems are increasing not only in frequency but in complexity.

They are no longer discrete events but interconnected phenomena spanning environmental, biological, and technological domains.

The current Foot and Mouth disease outbreak in South Africa is a classic example where the management of the disease spans from basic disease management to classification and typing of the virus, bureaucracy in importing the vaccines, and cooperation of various departments (One Health approach).

Typology of Animal-Related Disasters

A functional classification of disasters is:

- **Natural hazards** such as floods, droughts and wildfires.
- **Biological, Chemical and Nuclear threats** such as infectious disease outbreaks, zoonoses, chemical spills, and nuclear contamination of sorts.
- **Technological incidents** such as system and infrastructure failures.

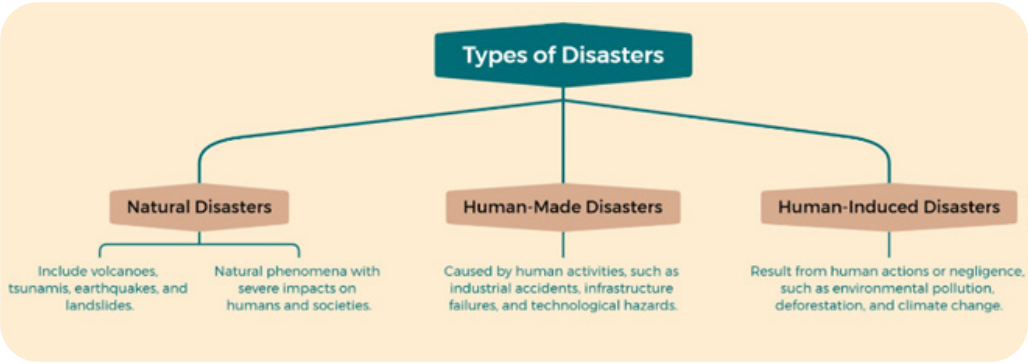


Figure 1: Types of disasters. The Aishub

- **Societal disruptions** such as conflict, displacements, and war.

Disasters can also be classified according to their origin, such as natural disasters, human-made disasters, and Human-Induced Disasters.

Operationally, these categories are rarely distinct, as one may overflow into the next. Effective preparedness must therefore be scenario-flexible rather than hazard-specific. The same basic processes will be implemented regardless of the disaster category.

Consequence Pathways

Animal-related disasters propagate through three primary pathways:

- **Health pathway** through disease emergence, injury, and mass culling/mortality.
- **Economic pathway** by production losses, supply chain disruption and market disruptions.
- **Social pathway** with livelihood impacts and community destabilisation.

Preparedness frameworks must explicitly account for these interdependencies.

Disaster Risk Management: A Systems Perspective

Disaster risk management is best understood as a **continuous, integrated system of risk governance**, rather than a sequence of discrete actions. This shift requires a transition from event-based response models to systems-based risk management. A linear system model can no longer be used. An expand-contract model is more apt where continuous preparation, prevention and contingency planning actions are done to ensure the correct level of preparedness once a disaster occurs (Figure 2).

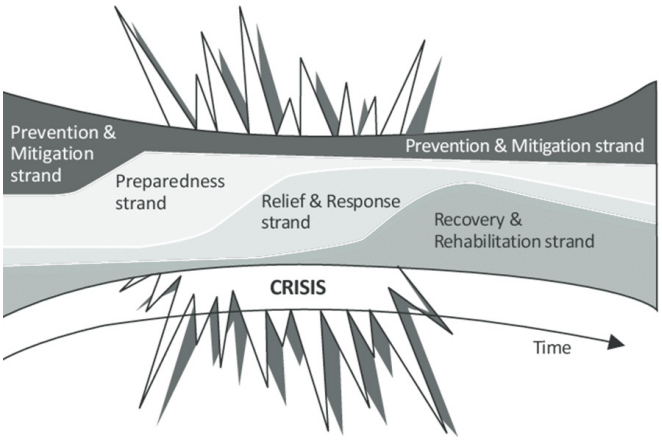


Figure 2: Source: Coburn, A.W., Spence, R.J.S. & Pomonis, A., 1994a, Disaster mitigation, 2nd edition., Cambridge Architectural Research, Cambridge

Core Functional Objectives

Effective systems must be capable of:

- Anticipating and reducing risk
- Detecting emerging threats early
- Responding rapidly and coherently
- Recovering while strengthening future resilience



Photo Credit: Joe Raedle/Getty Images

The Centrality of Preparedness

Preparedness is not a phase; it is an enabling condition across all phases. Weak preparedness invariably manifests as delayed responses, resource inefficiency, especially coordination between various professional groupings and governmental departments (One Health) and the escalation of otherwise manageable events.

Risk Avoidance as a Policy Outcome

A "culture of risk avoidance" is not rhetorical; it should be the outcome of institutional alignment, public awareness, operational capability, and contingency training. In the absence of these, risk reduction remains aspirational.

Veterinary Services as a Core Disaster Management Function

Institutional Positioning

Veterinary services must be formally embedded within national disaster management architectures. This requires that veterinary services have defined mandates (Veterinarians are now acknowledged by the WOAH and WHO as Health Professionals), the necessary legal authority to act, be formally integrated into command structures and have access to dedicated resources.

Without this, the veterinary response will be ad hoc and reactive, often escalating or complicating a disaster, such as the evacuation of pets during the height of a disaster.

System Responsibilities

Veterinary services must conduct continuous risk analysis, develop and maintain disaster plans, be operationally ready for response and recovery, and ensure coordination with public health, environmental, and emergency services. (See Figure 3 as an example)

Multisectoral Integration

Disaster management effectiveness is directly proportional to the degree of integration across health professionals, government departments, public and private sector stakeholders, veterinary and animal health stakeholders and the communities. Fragmentation is a primary failure point in disaster response systems.

>>>10

Animal Disaster Preparedness Quick Reference
How to prepare your pets in case of disaster

BEFORE

Planning:

- Natural Disasters includes: Floods, earthquakes, wild-fires, sudden cold spells, sudden hot spells, or Tornadoes/Cyclones
- Other disasters include gas leaks, train derailment, chemical spills, motor-vehicle accidents, and intentional acts of destruction like wars

Prepare for Disaster:

- Make sure your supplies are well stocked.
- Bring pets indoors where you can reach them easily.
- Have carriers for smaller animals and birds
- Check evacuation routes and confirm shelter arrangements
- Move livestock to higher ground. Do not leave them in an enclosed building where they cannot escape and make sure there are means of an evacuation.
- Remove or secure loose items from barnyards or pastures that can become projectiles.

AFTER

Assess home and pets:

- Keep pets confined
- Check home & property for damage.
- Make sure your fencing is intact and all animals are accounted for

Post-Traumatic Stress:

Disruption if regular routines is stressful for pets as well as people. You may notice behavior changes, loss of appetite , or other signs of stress.

DURING

If you evacuate:

- Take all your pets
- Make sure the pets are safely contained
- All pets must wear identification
- Take your emergency supplies – including water (bowls and containers as well)
- Livestock that could not evacuated should be left loose in pastures with shelter, not confined buildings. Post your emergency contact information – wrapped in plastic – at each entrance
- Allow plenty of time to trailer livestock and horses out of evacuation zones.

If you are outside of the evacuation zone and decide to shelter your pets

- Take all your pets
- Make sure pets are safely contained
- All pets must wear identification

If you are not home:

Pre-planning is the key. Make arrangements with a neighbor or family member in case something happens when you are not home. Provide a list and location of your disaster supplies, have a set location to meet, and provide a key to your home and name and contact details of your veterinarian.

Disaster Checklist:

- ❑ Pet I.D tags
- ❑ Pet passport/Record of vaccinations
- ❑ Leash, harness, muzzle (for large dogs
- ❑ Pet Carrier
- ❑ Write name and contact number in all pet items
- ❑ A three-day supply of food/water, plus feeding bowls
- ❑ Towels, blankets, newspaper and trash bags
- ❑ First-aid kit and per medications
- ❑ Veterinarians contact details
- ❑ Watertight container for medical records, medication and a recent photo of your pet
- ❑ List of emergency numbers of a relative or alternative care-taker and someone outside the area.

Figure 3 *Source: www.buttecounty.net/publichealth/animals*

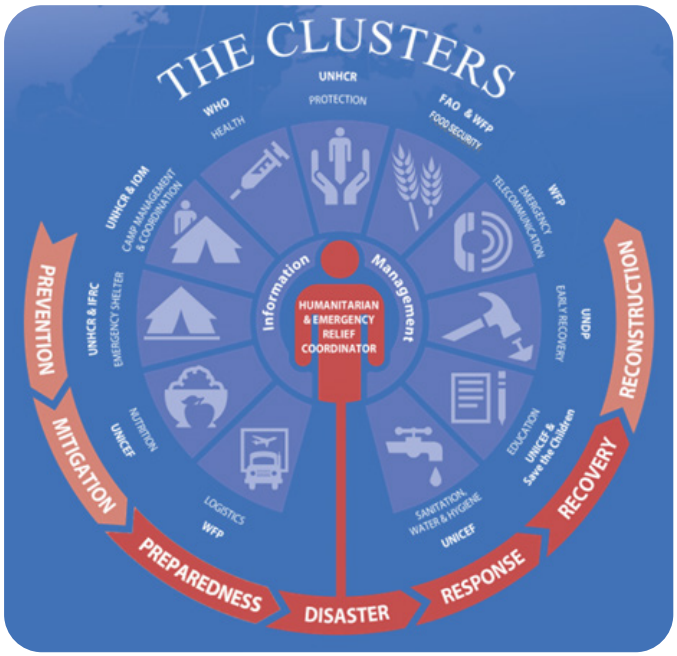


Figure 4

While most clusters operate during the response phase, the United Nations Development Programme UNDP, as a guideline, has established the Early Recovery cluster that focuses on the more long-term needs related to recovery. Through this cluster, UNDP links humanitarian efforts with development work.

This cluster aims to gradually turn the dividends of humanitarian action into sustainable crisis recovery, resilience building and development opportunities.

Prevention and Preparedness: Structural Requirements

Core Elements of a Prevention Framework

A functional prevention system requires:Risk identification and prioritisation

- Institutional frameworks with clear accountability
- Early warning and surveillance systems
- Resource allocation mechanisms
- Public education and awareness
- Routine simulation and testing

Each element is necessary; none is sufficient in isolation.

Early Warning and Detection

Early warning systems are the most cost-effective intervention point in disaster management.

Their effectiveness depends on surveillance coverage, data integration, rapid communication channels and defined response triggers.

Delayed detection converts manageable incidents into crises.

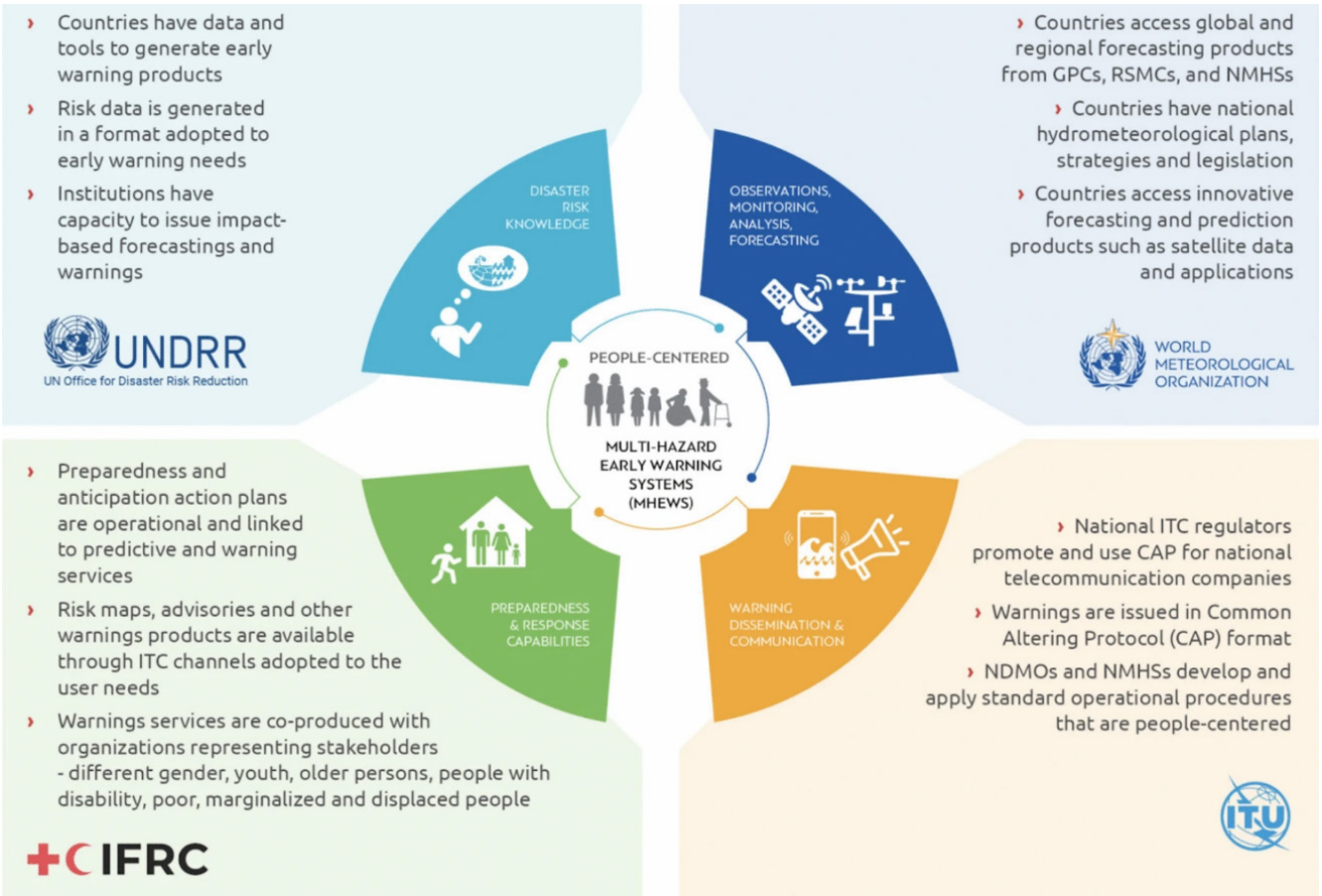


Figure 5. Overview of the four pillars of the Early Warnings for All Initiative. Acronyms are GPC: Global Producing Centre; RSMC: Regional Specialised Meteorological Centre; NMHS: National Meteorological and Hydrological Services; NDMO: National Disaster Management Office. Source UNDRR (2024a)

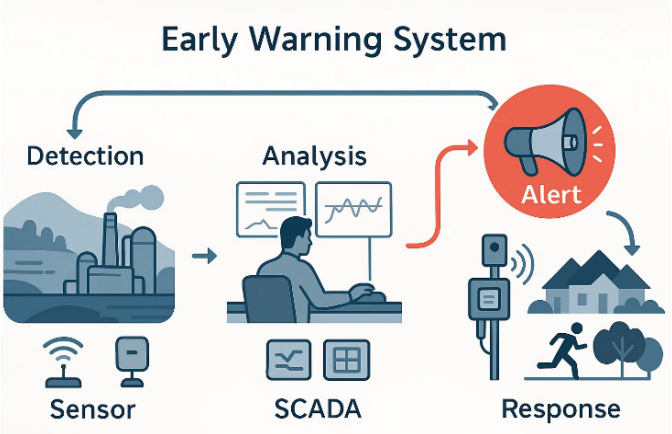


Figure 6:
https://www.lafcarr.com/en/early-warning-system-definition/

Biosecurity as Risk Containment

Biosecurity operates as the primary barrier against biological disasters. Its effectiveness is contingent on compliance, monitoring and enforcement. Biosecurity failures are rarely technical; they are typically systemic.

- **Scenario-based contingency plans**
- **Standard operating procedures**
- A **recovery and rehabilitation strategy**

Plans that do not translate into operational clarity are functionally irrelevant.

Scenario-Based Planning: Chemical Incident Case

As an example, a complex incident involving a chemical spill illustrates the following key operational requirements:

- Immediate establishment of controlled zones (hot, warm, cold)
- Parallel and coordinated human and animal response streams
- Dedicated veterinary decontamination and triage capacity
- Integrated command and communication systems

The defining feature of an effective response is **coordination under pressure**, not technical sophistication alone.

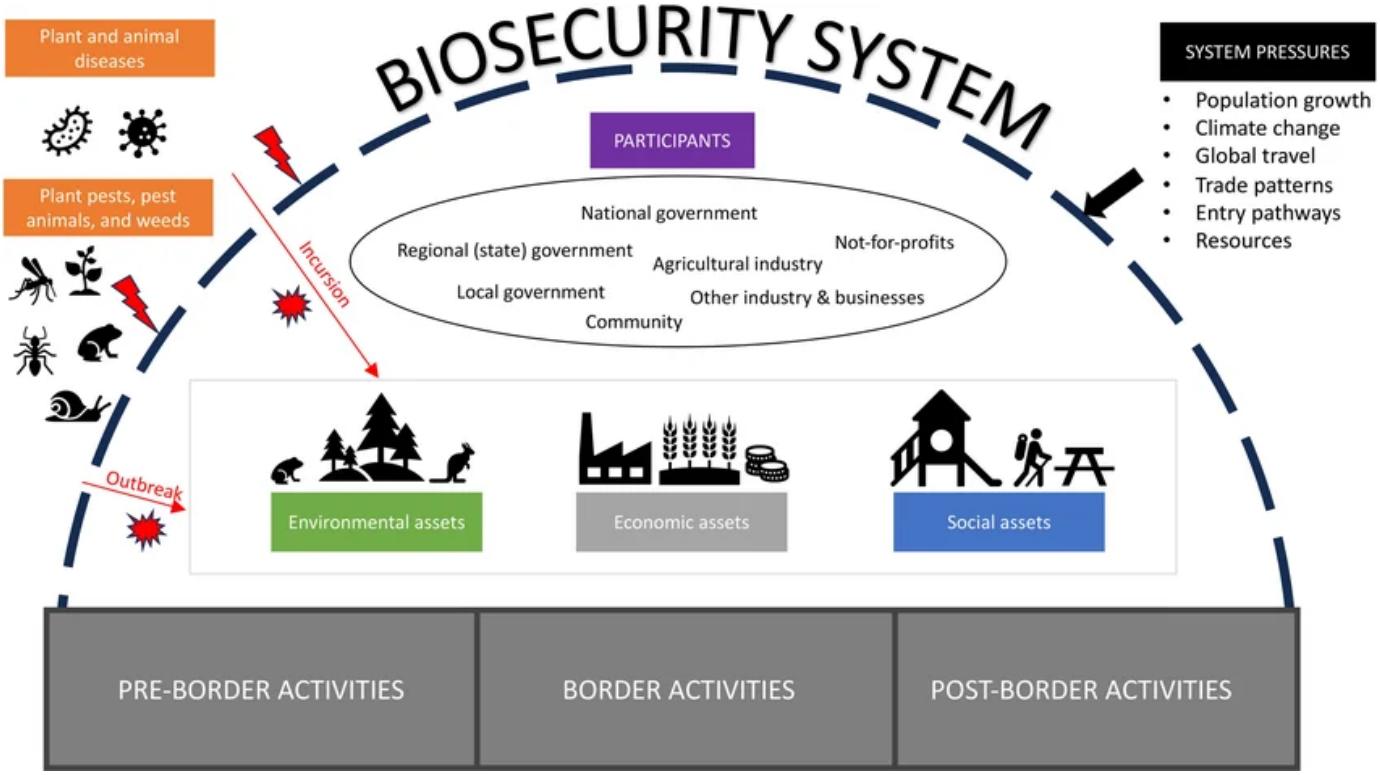


Figure 7:
Arndt, Edith & Schneider, Karen & Bland, Lucie & Robinson, Andrew & Gibert, Anaïs & Camac, James & Kompas, Tom. (2024). A conceptual framework for measuring and improving the resilience of biosecurity systems. Journal of Applied Ecology. 61. n/a-n/a. 10.1111/1365-2664.14707.

Contingency Planning: From Documentation to Execution

Structure of Effective Plans

A credible disaster management plan comprises:

- A **preparedness framework**

Critical Success Factors

Across scenarios, consistent determinants of effectiveness include clarity of roles and command. pre-defined communication protocols, availability of trained personnel and prior testing of plans under simulated conditions.



Figure 8: https://www.ie.edu/insights/disaster-risk-management/preparedness/effective-emergency-response-the-role-of-contingency-planning/

Capacity Building: The Determinant of System Performance

Capacity as a System Property

Capacity is not an attribute of individuals; it is a property of the system. It reflects skills distribution, institutional readiness, resource availability and coordination capability.

Functional Skill Categories

Capacity development must address the following four tiers:

- **Foundation:** focusing on awareness and basic competencies
- **Feeder:** to assist and drive risk identification and reporting
- **Integration:** ensuring cross-sector coordination
- **Execution:** responsible for the operational response

Weakness at any tier compromises the system.

Training and Simulation

Training must be continuous, scenario-based and multidisciplinary.

Simulation exercises are not optional.

They are the primary mechanism for validating plans and exposing system weaknesses.

Community as a Force Multiplier

Communities are important to extend response capacity, but only where awareness exists, their roles are defined, and trust in disaster institutions is established.

Unprepared communities increase system strain and could easily become a risk factor in themselves.

Operational Contexts in Veterinary Preparedness

Companion Animal Systems

Preparedness priorities in companion animal systems are owner education, evacuation planning and identification and traceability of animals.

Failure in this sector rapidly translates into human welfare and public health issues.

Livestock Systems

Livestock systems are vulnerable to disasters due to the scale of operations, often involving large numbers of animals, mobility constraints in rapidly evacuating them, and dependency on infrastructure, especially housing.

Preparedness must focus on continuity, not just response.

Wildlife Systems

Disaster impacts on wildlife are often underestimated. Veterinary roles include surveillance, rehabilitation of injured animals and risk management. Infrastructure repair, such as fixing washed-away fences, may become a priority.

Neglect in this domain increases long-term ecological and disease risks.

Communication and Coordination

Communication failure is one of the most consistent predictors of disaster response breakdown.

Internal Systems

Effective internal communication requires defined command hierarchies, standardised reporting structures and real-time information flow.

External Systems

Externally, communication must balance accuracy, timeliness and public reassurance. Poor communication amplifies both risk and perception of risk.

Recovery and System Reinforcement

Recovery is not only a return to baseline, but it is an opportunity for system strengthening.

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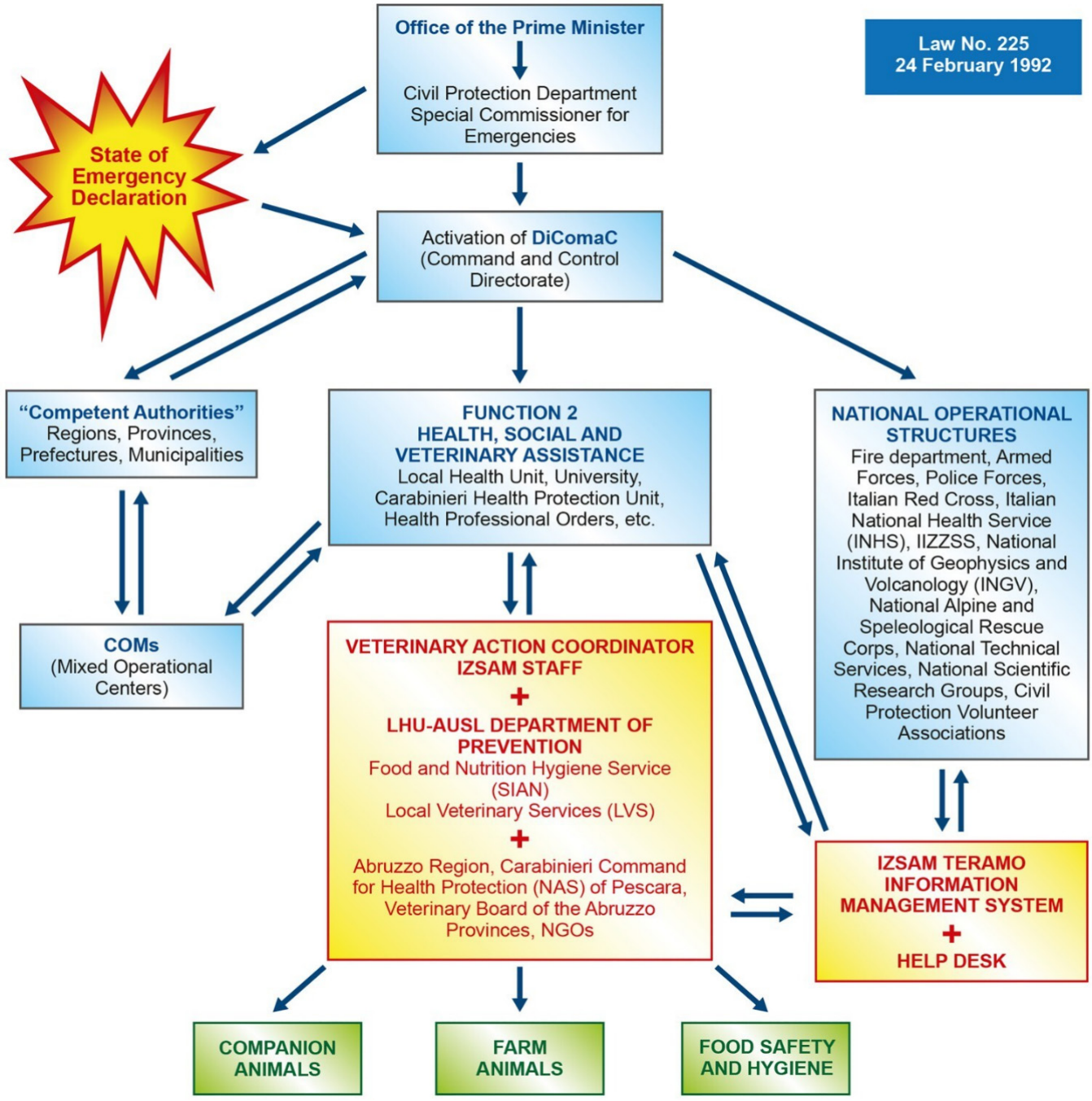


Figure 10: The Veterinary Action integrated system for disaster management and risk reduction, implemented on 9 April 2009, following the earthquake in L'Aquila (Abruzzo, Italy) 3 days earlier, by the director of the Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale" as co-ordinator of veterinary activities: https://doi.org/10.1080/00480169.2025.2566100

Veterinary Responsibilities

Post-disaster veterinary functions include:

- Ongoing clinical care
- Disease surveillance
- Re-establishment of services

Feedback into System Design

All recovery processes must feed into:

- Plan revision
- Policy adjustment
- Capacity enhancement

Systems that do not learn will fail repeatedly.

Structural Constraints

Persistent barriers include:

- Resource limitations
- Inadequate training
- Institutional fragmentation
- Low public preparedness

These are not incidental; they are systemic and require structural solutions.

A Consolidated Framework for Veterinary Disaster Preparedness

A functional system must integrate:

Planning
- Risk assessment
- Scenario development

Preparedness
- Training
- Resource allocation

Response
- Coordinated deployment
- Operational execution

Recovery
- Rehabilitation
- System improvement

This cycle must be continuous, not episodic.



Figure 11. Implementation strategies for One Welfare/ One Health in Emergency Management through an animal lens: https://doi.org/10.3390/ani11113141

The One Health Imperative

Disaster preparedness is inherently a One Health issue. The separation of human, animal, and environmental health systems is operationally inefficient and strategically flawed.

Veterinary services are uniquely positioned to bridge these domains. Their exclusion weakens the entire system.

Conclusion

Disaster preparedness within veterinary systems is not a technical challenge; it is a governance and systems challenge.

Effective preparedness requires:

- Institutional integration
- Operational clarity
- Sustained capacity
- Continuous evaluation

The central proposition is straightforward: **resilience is engineered, not improvised**.

Veterinary services must therefore be positioned, capacitated, and mandated as core components of disaster risk management systems. Without this, preparedness will remain partial, and response will remain reactive.

To manage disasters successfully, a One Health approach should be followed, ensuring collaborative coordination by all stakeholders.

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Rebecca J. Purc-Stephenson, Deanna K. Hood, Jenessa M. Doctor

The mental health impacts of depopulation on veterinarians

ABSTRACT

Background

"With every big outbreak, we lose staff": The mental health impacts of depopulation on veterinarians

Depopulation, involving the mass euthanasia of livestock, is an established practice in the agricultural industry to ensure animal welfare, human health, and economic stability by preventing disease spread. There is evidence that veterinarians involved in animal-disease management and depopulation experience significant and long-lasting mental health impacts.

Objective

This study examined the mental health impacts of depopulation on veterinarians and the ways to build their resilience to these stressful events.

Procedure

Using qualitative methods, 11 veterinarians and industry experts from Alberta participated in semistructured, one-on-one interviews between April 2023 and April 2024.

Results

Analysis revealed 3 main themes and 6 sub-themes: ongoing work-mental health tensions (including professional bond *versus* emotional labor, disease control *versus* moral distress, sense of duty *versus* trauma of the event), emotional detachment, and occupational distress (including emotional exhaustion, decreased job satisfaction and turnover intentions, and post-traumatic stress disorder symptoms). These themes were used to adapt the emergency-management framework for veterinarians involved in depopulation, to support their mental health and well-being.

Conclusion and clinical relevance

The pervasive behavioral and mental health challenges associated with depopulation highlight the necessity for education, training, support, and policy adjustments to safeguard veterinarians' mental health and well-being.

INTRODUCTION

Mass euthanasia of livestock is part of a complex process in the agricultural industry called "depopulation," a process of quickly and efficiently killing an entire herd or flock of animals in response to an emergency and doing so as quickly and as humanely as possible (1).

Although depopulation may be necessary due to emergencies such as the temporary border closures that occurred during the COVID-19 pandemic (2), it is often used for animal-disease management. There are 31 reportable diseases in Canada that can affect an animal or be transmitted by an animal to a person and are required to be reported to a veterinary inspector (3). Despite improvements in biosecurity (4), Canada reported 149 cases of herds or flocks affected by a reportable disease in 2023 (5), mostly avian influenza (AI, n = 133), followed by chronic wasting disease (n = 8), equine infectious anemia (n = 7), and bovine tuberculosis (n = 1) (5). For perspective, **.** 11 million birds from poultry operations have been depopulated due to AI since 2021, affecting 415 farming operations (5).

At the forefront of depopulation are veterinarians who work with their farmer client and report a suspected case, or those who work for the Canadian Food Inspection Agency (CFIA) to confirm a case and assist with depopulation orders (3). Even when the rationale for depopulation is understood (6,7), veterinarians often experience negative effects (8,9). For example, some veterinarians reported experiencing moral distress, characterized as grief, sadness, and stress and believed to stem from the "killing-caring paradox" in which veterinarians struggle to reconcile their compassion for animals with their professional obligation to euthanize them (10,11). Others reported the additional workload of providing emotional support to farmers going through depopulation (12). For example, during the footand-mouth disease outbreak in the United Kingdom, farmers preferred seeking support from veterinarians than community caseworkers or government staff (12).

Animal shelter workers and veterinarian nurses directly involved in euthanasia reported high levels of work stress and diminished job satisfaction (13). Another study of veterinarians involved in depopulation of swine reported elevated rates of burnout (6). Whereas veterinarians involved in depopulation have recognized the importance of mental health services (6), research shows that few use these services (6,9,14). Low mental health service use has been associated with beliefs that counselling would be ineffective (6,9,14), concerns about taking time off from work (7), and the cost of the services (6,9). Rather, veterinarians and animal service workers reported coping by separating themselves emotionally from their work (2,15). Although such approaches may provide temporary relief, they may give way to subsequent poor health outcomes (16). For example, 55.7% of the veterinarians who assisted in the 2010 foot-and-mouth disease outbreak in Japan reported mental distress 6 mo after the outbreak was controlled (17).

As depopulation may be associated with significant and long-lasting mental health issues (15) and livestock epidemics are challenging to control or eliminate (18), it is essential to understand how veterinarians are affected, to ensure their mental health and well-being needs are supported.

Further, there is no published study examining veterinarians' experiences during depopulation events in Canada. Recognizing this gap, we used qualitative methods to i) explore the mental health impacts of depopulation on veterinarians and ii) identify ways to build their resilience to these stressful events.

MATERIALS AND METHODS

We conducted a qualitative study using descriptive phenomenology, which is an inductive approach to explore and describe an individual's experience of a phenomenon without imposing preconceptions or interpretations (19). This method is often used when there is limited knowledge about a topic (19). Unlike interpretative phenomenology, which aims to understand the meaning of experiences within participants' sociocultural contexts (20), this method aims to generate knowledge and provide an authentic portrayal of the phenomenon (20).

Our sample included 11 participants (9 veterinarians and 2 industry experts) from Alberta. To be included, all veterinarians needed to have experience with at least 1 depopulation event. Five of the veterinarians had worked for or were currently working for CFIA. The industry experts were representatives from species-specific commodity groups and were part of an emergency response team involved in the coordination and support of depopulation events. Participants had been employed for 24.09 y (SD = 15.90), ranging from 4 to 44 y. They ranged in age from 36 to 67 y (M = 53.64, SD = 12.64) and had experience with cattle, swine, poultry, elk and deer, and/or sheep and goats. This research was approved by the University of Alberta's (Edmonton, Alberta) ethics review board (Pro00126250).

We recruited participants through notices posted to our study website and social media channels (*e.g.,* Facebook, newsletters) between April 2023 and April 2024. Those interested contacted the principal investigator (PI) to schedule an interview. Participants completed an individual, semi-structured interview with the PI, either virtually or by telephone, lasting 40 to 90 min. Participants were asked 4 background questions (*e.g.,* age, gender, job description, and animals they worked with) and 5 open-ended questions about their depopulation experience: i) Can you describe a depopulation event you were involved in? ii) In what ways, if any, did the experience impact you? iii) How did you cope during and after the experience? iv) Was there anything helpful that prepared you for the experience? v) Since being involved in depopulation, how has the experience changed your job satisfaction? Participants received a $50 gift card for an online retailer. Interviews were audio-recorded and transcribed verbatim.

Before analysis, all identifying information was removed from the transcripts. Participant names were replaced with pseudonyms. Next, transcripts were independently analyzed by the 3 authors. Our analysis was guided by Colaizzi's 7-step process (21): i) review the transcripts to become familiar with them, ii) identify significant statements and phrases relevant to the topic, iii) describe the meaning of the statements and phrases, iv) merge statements to create themes and sub-themes, v) provide a full description of the topic, vi) identify the core framework that characterizes the topic, and vii) validate findings with subject-matter experts. Although we acknowledge that new meanings can always emerge from data, our decision about when to stop coding and move to the subsequent steps in the analytic process was based on our interpretative judgments (22). Specifically, we ceased coding when no new ideas were being identified and we stopped analysis when the generated themes were relevant and coherent in addressing our research question (22). Three industry experts (1 veterinarian and 2 industry experts) reviewed our findings and provided feedback that our results reflected their experiences.

As descriptive phenomenology requires researchers to generate knowledge without preconceptions and biases, we used bracketing (23). Bracketing involves acknowledging and setting aside one's preconceptions to allow the topic to be understood more authentically from the participants' viewpoints. For this study, 2 of the researchers (JD, DH) had limited knowledge of depopulation and veterinary practice, whereas the PI (RP) had been researching the topic for several years. All researchers discussed their personal and professional connections to the topic. All data were double-coded by the 3 authors, and we met regularly to review the goals of the study, compare interpretations, discuss differences, and reach a consensus.

RESULTS

Our analysis revealed 3 major themes and 6 sub-themes. Each theme is described below using verbatim quotes.

Ongoing work-mental health tensions

Initially, we identified 3 distinct work-related themes and 3 mental health strains. Upon deeper analysis, we observed how these themes were interrelated, reflecting a broader concept. Specifically, depopulation disrupted work roles and goals, imposing strains that spilled over into participants' personal lives, affecting their well-being. Each sub-theme is described below.

Professional bond* versus *emotional labor. Years of working closely with a farmer client had fostered a deeply trusting professional bond, whereby the veterinarian became a farmer's "go-to source" for education and an important figure in their life. One veterinarian explained, "We're part of the family. I've been invited to family dinners, weddings, and even funerals… It's not like other professions, and that's what I tell my students. We treat people, too" (Vicky, veterinarian). During depopulation events, the support they provided to their farmer clients intensified. Even if these veterinarians were not directly involved in the depopulation order, many felt they were "brought along for the journey." For example, a veterinarian was often the first person their farmer client contacted when they suspected their animals were sick and was the one to deliver test results. Although many described wanting to support farmers and felt it was their duty, they acknowledged how this additional work made them feel emotionally extended and pulled away from whatever they were doing. As 1 industry expert explained,

"These phone calls are happening any time of the day… You put yourself out there to support them, and you kind of live in this with them. And you're in trauma when you leave the call because you're going through this with them, you're feeling their pain and it's hard. It's hard to go back to whatever you're doing after that." ***(— Ryan, industry expert)***

Most expressed genuine empathy for farmers going through depopulation. One veterinarian shared, "I was just at a conference with somebody who's going through [avian influenza], and nobody sat next to him" (Chris, veterinarian). These veterinarians often called their farmer clients daily to check on how they were coping. Even veterinarians directing depopulation orders who did not know the farmers also provided this type of emotional labor. One participant explained,

"If it was a really big case that took months to clear, you could be working very closely with a farmer, without having known them before, in an incredibly stressful personal situation… You'd be caught up dealing with them daily through probably the worst emotional crisis they've ever had in their life. So that was very intense… I was also the person who was one-on-one supporting them through all of this." ***(— Janet, veterinarian)***

Disease control* versus *moral distress. Participants described struggling to balance the satisfaction that came from controlling the spread of a disease and keeping people healthy with the moral distress of euthanizing animals.

>>>18

Many found relief in their involvement by reminding themselves that the purpose and methods were supported by science. As 1 participant explained, "Some of the successes come from helping producers. I was quite proud to be able to facilitate eradicating this very nasty disease out of 27 different farms through a process that's science-based. There's moments like that" (Jim, veterinarian).

Conversely, all struggled with their professional identity as their job required them to kill entire herds or flocks of animals. One participant described, "Well, if you're directly involved as a veterinarian where you have to destroy animals, that wasn't the reason you came into the world and it's very hard… You know, you're here to help them and save them… It's hard" (Ronald, veterinarian). These feelings were particularly acute when seemingly healthy or young animals had to be killed. Several participants also mentioned that killing mammals was challenging. One participant explained,

"I've done lots of depops on poultry and I don't enjoy any of it. But I was never damaged from it. Pigs are like dogs, and they make eye contact. So, I gotta tell you, the number of pigs that I killed, when they look right in my eyes… It just hits different." ***(— Alex, veterinarian)***

Veterinarians involved in some of the first AI cases described feeling morally distressed because the processes and methods were not established, but acknowledged that processes had improved with subsequent outbreaks and that, now, "CFIA has got a pretty tightly run ship" (Chris, veterinarian). Others who participated in swine depopulation warned that the industry was not prepared for African swine fever.

Sense of duty* versus *trauma of the event. Many expressed a strong sense of duty to fulfill their job responsibilities yet struggled to euthanize so many animals. They coped by focusing on work tasks, ensuring the humane treatment of animals, and following professional guidelines. One veterinarian explained, "So you compartmentalize your job because it's your job. You have to do it. I looked at it scientifically" (Janet, veterinarian). Others focused on the potential strengths their profession offered to public health and animal welfare. For example,

"I don't want to see sick kids from contaminated eggs. I don't want to see sick kids from dirty milk. I don't want to see barns full of birds dying. And so that, by itself, helps me, and I think if I didn't have to do too many at once, I'll be okay." ***(— Dorothy, veterinarian)***

The quote above highlights the challenge of the actual task. Participants found the actual day of euthanasia traumatic and exacerbated by knowing the farmer, long hours, limited breaks, small team size, and working consecutive days. Many noted that their drive to "just get it done" led to euthanizing a large number of animals in a single day but contributed to emotional strain, fatigue, and even physical injuries. One participant explained,

"So, I think we killed almost 500 [animals] in a day. It was a very small crew. It was a very long day… It was [spring] so it was pretty cool and wet. And I just remember we were all just, like, catatonic by the end of the day." ***(— Alex, veterinarian)***

Emotional detachment

Participants described coping by emotionally detaching and focusing on completing the task. Some felt unsure how to manage their emotions or those of others, citing how their training prioritized teaching techniques and physical safety. Others described feeling guilty expressing emotions because it seemed incongruent with their professional role. One participant explained,

"[I have] lots of training on the practical [and] the physical safety of things. I have zero training on mental health, either for me or my staff, or for the people we're dealing with… Now with some people, they've been so distraught that they just need to talk to somebody and so they'll talk to me because I'm there. And you know, you listen and you do what you can, but I have to maintain my status as a regulatory vet. I am required to enforce policies, programs, or laws." ***(— Dorothy, veterinarian)***

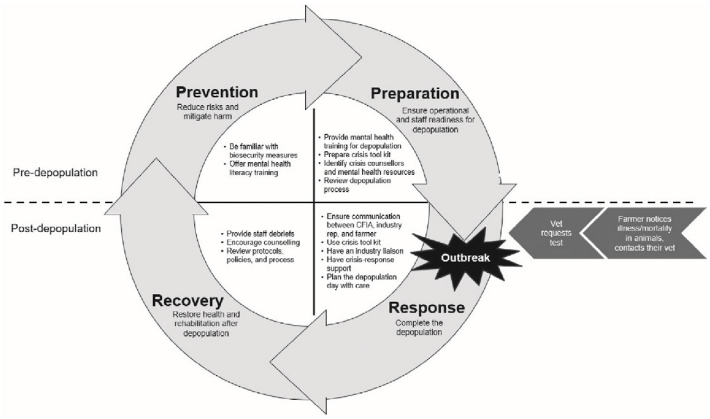
This coping mechanism, however, exacerbated participants' struggles over time. One participant highlighted how unresolved emotions from past outbreaks contributed to their enduring mental health challenges, "I didn't cope well. We finished everything off. I took a little bit of vacation time [but] I was very, very sick, physically sick from it… I think my body was catching up to what my eyes had seen" (Alex, veterinarian). Nearly all mentioned that they felt unprepared to cope with the depopulation and the pressures placed on them. One participant explained, "I think sometimes when we talk about mental health, the veterinarians are sometimes forgotten about because they're the professionals" (Megan, veterinarian).

Occupational distress

Prolonged exposure to unmitigated stressors led to emotional and occupational consequences. We termed this theme "occupational distress" to reflect the ongoing strain arising from high stress, moral distress, and traumatic events of the work.

Emotional exhaustion. Participants described how the prolonged stress and workload associated with depopulation and supporting farmers made it challenging to juggle other work responsibilities and attend to their own needs. Participants described reaching a point of emotional exhaustion. Contributing to this were the frequent and intense interactions with farmer clients during depopulation that blurred boundaries between professional and personal life, leaving veterinarians feeling unable to "switch off" their professional role at home. As one participant explained, "I try to process but the problem with being an agriculture vet…is that you're on 24/7, right? My work phone is my personal phone" ***(— Chris, veterinarian)***.

Job satisfaction and turnover intentions. Direct involvement in depopulation often resulted in reduced job satisfaction due to the persistent pressure, moral distress, and limited resources. One participant explained, "You feel kind of like the doctor just giving bad diagnoses… It's really hard" (Ryan, industry expert).



Another participant explained the difficulty of retaining staff by stating, "I can see why people would not do it. With every big outbreak, we lose staff, because they just say, 'we can't do this'" (Dorothy, veterinarian). For several participants, their experience with depopulation prompted a reevaluation of their career path to protect their own mental health. For example, 1 participant described a negative depopulation event and simply stated that they quit their job "because of the depop" (Alex, veterinarian). For another participant, the persistent worry that they might one day have

to respond to a major outbreak motivated them to leave the emergency response network:

"I didn't want to continue working full time and having to do that… I think, the constant pressure knowing that…we're getting more of these outbreaks and it's just a matter of time before we get 'the big one.'" ***(— Janet, veterinarian)***

Post-traumatic stress disorder (PTSD) symptoms. Those directly involved in depopulation reported experiencing PTSD symptoms including vivid flashbacks of the event, nightmares, increased alcohol consumption, difficulty concentrating, guilt, and fear about when another outbreak might start. One participant described, "I've never been through something like that before. And so, when you start crying in the swimming pool, and you're like, okay, am I losing it?" (Janet, veterinarian). Several warned that participating in multiple depopulation events in close succession was risky to their mental health. One participant explained, "We were really short staff last summer dealing with [disease]. And I got to the edge of what I was able to do" (Dorothy, veterinarian). Others described how their familiarity with a farmer and their animals increased their symptoms. One veterinarian stated, "I still lose sleep over those cases in [location]. I knew those producers" (Chris, veterinarian). Most stressed the need for preparing veterinarians and their staff for what they might see during a depopulation, so they could mentally prepare themselves.

One veterinarian explained,

"[Y]ou need to have discussions with people before they do these things so that they're prepared for what they're going to see. I mean, you can't unsee, unsmell, and unhear those things… I was diagnosed with PTSD from what happened." ***(— Alex, veterinarian)***

Depopulation emergency-management framework

Using data from our study, we adapted the emergency management framework (24,25) to illustrate ways of minimizing mental health threats for veterinarians involved in depopulation (Figure 1). This framework is a continuous 4-phase cycle: prevention, preparation, response, and recovery. A comprehensive list of potential activities for each phase is shown in Table 1. To review briefly, in the prevention phase, activities include familiarizing veterinarians with biosecurity measures so they can communicate these to their farmer clients and reinforce why they are important, and enhancing mental health literacy through veterinary college curricula and professional education. In the preparation phase, proactive depopulation training, protocol reviews, and discussions with staff are essential. Building a network of mentally prepared veterinarians may prevent adverse mental health outcomes from repeated depopulation events. During the response phase, effective crisis management should involve continuous communication with CFIA, industry representatives, and the farmer, alongside support from an industry liaison or crisis support worker familiar with agriculture. In the recovery phase, reviewing policies and protocols, encouraging counselling, and conducting staff debriefs are crucial. The debriefs should focus on what went well, challenges faced, and process improvements. This framework aims to support veterinarians through every stage, ultimately enhancing their resilience and capacity to manage the emotional and psychological demands of their work.

DISCUSSION

Our study provided insights about the ways depopulation can negatively affect the mental health of veterinarians. We also learned how veterinarians fulfilled different roles in depopulation events that influenced their experiences in different ways. Some operated *outside* the depopulation process, offering continuous emotional and informational support to their farmer clients. They noted their farmer clients preferred confiding in them due to established trust developed over years of service, consistent with previous research that farmers relied on veterinarians during crises (12,26).

Table 1. Activities to support depopulation risk management for veterinarians

Phase	Activities
Prevention	• **Familiarize veterinarians with biosecurity measures** so they can communicate these with their clients and reinforce the importance of incorporating these measures into their operations. • **Integrate mental health literacy content** into veterinary college curricula and ongoing professional development training opportunities.
Preparation	• **Provide mental health training** to the emergency response team to ensure they: — are familiar with mental health warning signs. — feel confident and comfortable discussing mental health issues. — are familiar with stress-management strategies. — have resources such as counselors or crisis hotlines to contact. • **Provide an overview of the depopulation process** to ensure staff have a realistic preview of what to expect *(e.g.,* integrate guest speakers). • **Prepare and/or review a crisis tool kit,** which is a booklet containing species-specific disease information, timelines, protocols, and tips for supporting crisis-response teams and the farmer during a depopulation event. • **Review the depopulation process** to identify and minimize potential mental health triggers. • **Identify crisis counsellors and therapists** in the region who can accept new clients on short notice. • **Create a resource sheet** that can be shared and provides a list of available counsellors and therapists in the area, as well as crisis hotline numbers.
Response	• **Use the crisis-response tool kit** to guide conversations with veterinarians, farmers, and staff. • **Include an industry liaison** to support the farmer and ensure they have access to a counselor for their mental health needs. • **Ensure that breaks are scheduled** during the euthanasia process for staff to rest, evaluate, and change their roles; and provide an opportunity to debrief at the end of the day to discuss goals and the process and check on each other's well-being.
Recovery	• **Conduct a debriefing session** with staff to review what went well, what challenges were faced, and how the process could be improved. This session could be led by a staff supervisor or an external facilitator. • **Encourage staff to participate in counseling.** • **Review protocols and policies** and make recommendations for improvement.

Veterinarians who operated *within* the depopulation process and carried out the orders were sympathetic to the farmers but felt they needed to focus on regulatory compliance and safety protocols.

Veterinarians commonly experienced moral distress when tasked with euthanizing entire herds or flocks. This aligned with previous research

on veterinary professionals and animal shelter workers (6,7) and supported Arluke's (10) concept of the killing-caring paradox. For many, euthanizing a large number of animals created an internal conflict that threatened their professional identity and decreased their job satisfaction, led to turnover intentions, and affected their mental health. Veterinarians providing continuous high levels of emotional support experienced emotional exhaustion, an element of burnout.

Burnout is a psychological syndrome comprising emotional exhaustion, depersonalization, and a sense of reduced personal accomplishment (27). In previous research, Canadian veterinarians reported higher levels of burnout, compassion fatigue, and suicidal ideation compared to the general population (28).

Emotional detachment and focusing solely on the task to cope was common among participants. Although these strategies may offer temporary relief in uncontrollable and stressful situations (29), they typically provide few long-term benefits. Not surprisingly, most experienced distress and several described having PTSD symptoms following depopulation, including intrusive thoughts and cognitive and emotional changes such as anxiety and feeling triggered by certain sounds, smells, and images. Some researchers have labeled this form of PTSD "perpetrationinduced traumatic stress" (7,30). Although perpetrationinduced traumatic stress does not involve a direct threat to a veterinarian, witnessing traumatic events and actively participating in them threatens their ethical character and identity as someone who cares for animals (7,30). As with PTSD, the prolonged mental health impact of depopulation often surfaced weeks after the event. This is consistent with a study that reported 50% of veterinarians involved in an emergency response experienced immediate behavioral health issues and 32% reported still having symptoms 6 mo later (15).

There are several implications of the findings. Drawing upon the experiences of our participants, our recommendations in Table 1 align with suggestions of other researchers (31). For example, veterinarians would benefit from tailored training and education to address the unique challenges of depopulation. Incorporating mental health components into euthanasia curricula, which traditionally focus on technical methods and physical safety, is crucial to reduce mental health difficulties (32). Our participants believed knowing what to expect could have mitigated negative effects. National organizations such as the Canadian Centre for Agricultural Wellbeing have developed crisis tool kits, disease-specific guides that provide information and offer ways to support the emotional needs of those involved in depopulation (33). Also, the Mental Health Commission of Canada offers a mental health first aid course for recognizing the early signs of mental health decline and learning ways to support someone in crisis (34). Furthermore, a growing network of therapists in Canada who are familiar with the stressors of agriculture offer counselling support (35). It is important that these resources are shared with veterinarians and their teams. Another crucial aspect of preparation involves mapping the euthanasia process. An efficient process not only outlines each step but also pinpoints potential triggers in the process so that trauma responses are minimized or eliminated.

In terms of limitations, our cross-sectional design prevented tracking participants' well-being over time. However, to capture a broad range of perspectives, we recruited participants with diverse backgrounds and experiences. Also, our sample was small. Although we had enough data to conduct our exploratory study and generate knowledge (20), it is important that our findings are validated using larger samples and even quantitative surveys. Moreover, since our study was conducted in Canada, the findings may not generalize to other regions. Whereas further research is necessary to corroborate our findings, this study represents the first qualitative examination of the psychosocial impact of depopulation on Canadian veterinarians, providing valuable insights and comparison data.

Our analysis of veterinarians' experiences with depopulation highlighted the complex balance between professional obligations and personal well-being, as well as long-term psychosocial consequences. A reliance on emotional detachment tended to be an ineffective coping strategy, as many participants experienced emotional exhaustion, reduced job satisfaction, turnover intentions, and even PTSD symptoms. The adapted disaster risk-management framework offers ways to understand the resources that can be provided to support veterinarians during depopulation events and decrease risks to their mental health. CVJ

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Euthanasia of animals – association with veterinarians' suicidal thoughts and attitudes towards assisted dying in humans: a nationwide cross-sectional survey (the NORVET study)



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Abstract

Background: Veterinarians are an occupational group with an increased suicide risk. Euthanising animals may influence both veterinarians' views on assisted dying in humans and their suicide risk. We investigated (I) attitudes towards assisted dying, (II) whether the field of work and the frequency of euthanising animals were associated with positive attitudes towards human euthanasia, and (III) whether frequently euthanising animals was associated with serious suicidal thoughts.

Methods We conducted a nationwide cross-sectional study among veterinarians in Norway (response rate: 75%). Logistic regression models were used to calculate the odds ratios for both positive attitudes towards human euthanasia and serious suicidal thoughts. The analyses were adjusted for socio-demographic and work-related factors.

Results: Fifty-five percent of the veterinarians agreed that euthanasia should be permitted for humans with a fatal disease and short life expectancy. Working with companion animals was independently associated with positive attitudes towards human euthanasia (OR = 1.66 (95% CI: 1.23–2.23)), while veterinarians' frequency of Euthanising animals was not. The frequency of Euthanising animals was independently associated with serious suicidal thoughts, OR = 2.56 (95% CI: 1.35–4.87).

Conclusions: Veterinarians' attitudes towards assisted dying in humans did not differ from those of the general population. Veterinarians' frequency of Euthanising animals was not associated with positive attitudes towards euthanasia in humans. However, veterinarians working in companion animal practices were more likely to have positive attitudes towards euthanasia in humans. Moreover, euthanising animals five times or more a week was associated with serious suicidal thoughts. We need more research to infer causality in these findings.

Background

Several studies have found that veterinarians have higher suicide rates than the general population [1–3]. The reasons for elevated suicide risk among veterinarians remain unclear, and more studies exploring psychological and work-related risk factors are needed.

Euthanising animals is a task unique to veterinarians. It has been hypothesised that Euthanising animals may influence veterinarians' view of assisted dying in humans [4] (see Fig. 1 for a definition of the term 'assisted dying') and veterinarians' suicide risk [4, 5]. Studies on both of these possible influences are scarce.

A possible association between animal euthanasia and attitudes towards assisted dying in humans among veterinarians is scarcely studied. Previous studies have suggested that animal euthanasia might affect veterinarians' attitudes towards assisted dying, viewing euthanasia as a way to alleviate suffering through death [6], and even to alleviate their own suffering if they experience suicidal thoughts [4]. To our knowledge, only one study from the UK has investigated the possible association between euthanising animals and being in favour of human euthanasia [7]. No such association was observed. However, the cited study included only veterinary students and recent graduates (32% response rate).

In humans, knowledge of assisted dying through work experience is hypothesised to be associated with restrictive attitudes towards such practices [8, 9]. Several studies have indeed found that physicians have a more restrictive view on assisted dying than the general population [10–12]. This restrictive view is probably partly due to assisted dying being a dilemma, both in terms of professional value and role conflicts [12]. Veterinarians constitute an occupational group with extensive knowledge and experience of euthanasia of their animal patients. Similar to the conflicting role of physicians in end-of-life care, animal euthanasia has been called the 'caring-killing paradox', i.e. the conflicting situation of Euthanising animals when you are trained to provide care [13].

One study among veterinarians found that they have a more liberal view of assisted dying than physicians, thus questioning the hypothesis that knowledge of assisted dying is unambiguously associated with restrictive attitudes [9]. Moreover, palliative care and animal hospices are emerging in veterinary medicine [14]. The influence that animal euthanasia might have on veterinarians' views on assisted dying in humans is scarcely studied. To date, little is known about the factors associated with the apparently more liberal attitudes among veterinarians towards assisted dying in humans, and whether attitudes towards euthanasia in humans are associated with having serious suicidal thoughts.

Veterinarians may experience several challenges with Euthanising animals, both in decision-making and ethical considerations, and this could be a source of moral stress [15]. These challenges may be partly due to major developments in veterinary medicine and the fact that companion animals are often considered family members. Most studies investigating the impact of Euthanising animals have been conducted on companion animal veterinarians. Thus, the impact of euthanising other animal species, such as food-producing animals, is not well known.

The three job stress factors—emotional demands, work-life balance and fear of complaints/criticism, and field of work—were not independently associated with serious suicidal thoughts among veterinarians in a previous study using the same sample of veterinarians as used in the present paper [16]. Nevertheless, veterinarians reported work factors as contributing to their suicidal thoughts. We suggested that there might be specific work factors for veterinarians that were not captured by the variables in the regression model used [16]. In the present paper, we therefore aimed to further investigate a work factor unique to veterinarians, namely animal euthanasia, and its possible association with both attitudes towards assisted dying and serious suicidal thoughts.

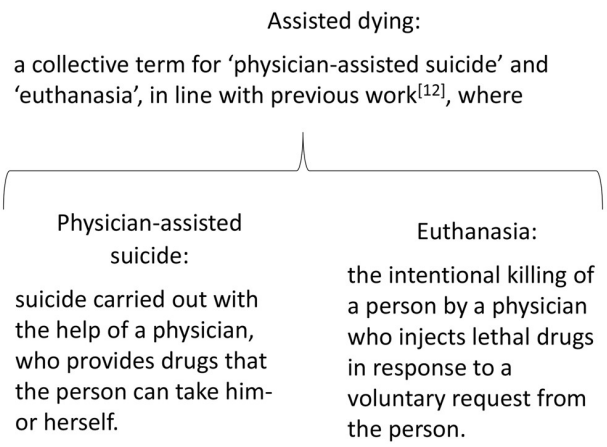


Figure 1: Definitions of assisted dying, physician-assisted suicide, and euthanasia

One study among veterinarians found a positive correlation between attitudes towards human euthanasia and an accepting attitude towards human suicide [7]. Moreover, an association between animal euthanasia and a lack of fear of death among veterinary students has been demonstrated [17]. Among graduate veterinarians, lower distress towards Euthanising animals was associated with a lesser fear of death, in line with findings among veterinary students [18]. Conversely, frequently euthanising animals was shown to attenuate the impact of depression on suicide risk, suggesting that euthanasia may be a protective factor against suicide [19]. The aforementioned study was cross-sectional, hindering any conclusions about causality in their findings. However, the authors suggested three possible explanations for a protective effect of euthanasia of animals on suicide risk: 1) veterinarians experience the impact that death has upon loved ones (animal owners), 2) euthanasia highlights the finality of death, and 3) emotional transference through repeated exposure to gratitude and thankfulness from animal owners may buffer the negative affect of depression [19]. Self-poisoning is a common method of suicide among veterinarians [1, 2, 5, 20–22]. Barbiturates (the class of drug used for Euthanising animals) have been shown to be the most commonly used drug for self-poisoning [2, 23]. Therefore, we need to explore further the role of Euthanising animals in relation to veterinarians' suicidal thoughts. Also, when investigating a possible association between animal euthanasia and serious suicidal thoughts, it is important to control for possible confounders, such as working hours and perceived colleague support. Working hours could be a confounder in the possible association between suicidal thoughts [24] and the frequency of animal euthanasia (more working hours could lead to a higher number of euthanasia procedures). Colleague support could be a confounder in the possible association between suicidal thoughts [25] and veterinarians' frequency of Euthanising animals (lack of colleague support may lead to more euthanasia, as there is no one to consult).

As mentioned, veterinarians are a high-risk occupational group for suicide. The possible association between animal euthanasia and attitudes towards assisted dying in humans and between animal euthanasia and suicidal thoughts is scarcely studied among veterinarians. Research on representative samples of veterinarians regarding both of these aspects and their possible interplay is lacking. Such research might contribute to a better understanding of the complexity of suicidality among veterinarians.

To our knowledge, this is the first nationwide study with a large representative sample of veterinarians investigating whether the main field of work and frequency of Euthanising animals is associated with positive attitudes towards human euthanasia, and whether the frequency of Euthanising animals is associated with serious suicidal thoughts among veterinarians. We would expect a significantly positive association in both research questions 2 and 3.

The research questions were as follows:

1. What are veterinarians' attitudes towards physician-assisted suicide and euthanasia in humans?
2. Is the main field of work and veterinarians' frequency of Euthanising animals associated with positive attitudes towards euthanasia in humans?
3. Is the frequency of veterinarians' euthanising animals associated with serious suicidal thoughts?

Methods

The sample included all veterinarians in Norway, holding a valid authorisation in May 2020 (n = 4256), according to information retrieved from the Norwegian Food Safety Authority, which is the national authority granting veterinary authorisation. We excluded some veterinarians based on the following criteria: no residential address in Norway (n = 527), unknown current address (n = 196), working abroad (n = 62), and those deceased (n = 7), resulting in an eligible sample of 3464 participants.

A 12-page questionnaire, together with an information sheet and a pre-paid reply envelope, was distributed by mail to 3464 veterinarians in November 2020, with two reminders being sent in January and February. The questionnaire was in Norwegian, and it took between 15 and 30 min to complete. There was also a reminder in The Norwegian Veterinary Journal and on the webpage of the Norwegian Veterinary Association. Information about the

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survey was also disseminated through social media, both by the first author and by the Norwegian Veterinary Association. Five gift cards from a sports shop were drawn among the respondents of the survey to increase the response rate. The researchers did not know the identities of the participants.

This study was approved by the Regional Committees for Medical Research Ethics South East Norway (132704) and the Norwegian Centre for Research Data (674793).

Instruments

Dependent variable – research questions 1 and 2 Attitudes towards assisted dying were investigated using four statements previously used on physicians in Norway [12], namely: 1) 'Physician-assisted suicide should be permitted for persons suffering from a fatal disease with a short remaining life expectancy'; 2) 'Euthanasia should be permitted for persons suffering from a fatal disease with a short remaining life expectancy'; 3) 'Assisted dying should be permitted also for persons suffering from an incurable chronic disease, but who are not dying'; and 4) 'There are cases in which it may be right/morally defensible for the doctor to provide assisted dying, even though it is illegal'. The veterinarians were asked to state their agreement on a Likert scale from 1–5, ranging from 'strongly agree' to 'strongly disagree'. For research question 1, we investigated the level of agreement with each statement. Definitions of the terms assisted dying, physician-assisted suicide and euthanasia were included in the questionnaire.

Veterinarians routinely perform animal euthanasia, while the prescription of medicinal products that animal owners can give to their animals is not common practice (in which the latter would be the parallel to physician-assisted suicide in humans). Therefore, we chose the second statement regarding attitudes towards euthanasia in humans as the dependent variable for research question 2, as this would be the procedure veterinarians have the most experience with through their work. The variable was dichotomised so that 'agreed' included both 'strongly agree' and 'partially agree', to make clear the distinction of those having positive attitudes towards the statement. 'Disagree' encompasses the remaining alternative responses ('neither agree, nor disagree', 'partially disagree' and 'strongly disagree)', in line with a previous study [12].

Dependent variable – research question 3 Paykel's questionnaire is a five-item instrument developed to study suicidal thoughts and attempts. The five items represent increasing severity, from unspecific suicidal feelings, and a wish to die, to suicidal thoughts, serious suicidal thoughts (plans), and suicide attempt [26]. Serious suicidal thoughts were used as the dependent variable for research question 3. The question was a slightly modified version of the fourth question of Paykel's questionnaire [24, 26]: 'Have you ever during the last year reached the point where you seriously considered taking your life, and even made plans how you would go about doing it?' The responses were 'never', 'hardly ever', 'sometimes', and 'often'. Responses were dichotomised into 'never' and 'any frequency', in line with Paykel's original work. Paykel's question number four has been used as the dependent variable in several studies across multiple professions in Norway previously, including veterinarians [16, 27, 28].

Exposure variables

The participants reported the following as their main fields of work: 'companion animal practice', 'production animal practice', 'mixed clinical practice', 'equine practice', 'aquaculture', 'public administration', 'academia/research', 'pensioners', and 'other' [16]. In the regression analyses, 'mixed clinical practice' was chosen as the reference category, as this could be viewed as the most traditional veterinary work in Norway. Since work-related factors were included in the model, pensioners were excluded from the regression analyses. Field of work was used as an exposure variable for research questions 2 and 3.

Frequency of Euthanising animals was measured using a single item: 'If you work in clinical practice, how many euthanasia procedures do you perform on average in a normal week?' Responses were categorised as follows; 0–4, 5–9, 10–14, and 15 or more. Due to low numbers in the latter three categories, the variable was dichotomised into 0–4/week and 5 or more/week. The total proportion of missing data on this instrument was 36%. This is probably due to the question being directed to veterinarians working in clinical practice. In our sample, however, many veterinarians work in non-clinical fields. After cross-tabulating the frequency of euthanasia with the different fields of work, it was evident that the majority of the missing answers to this question was among veterinarians in non-clinical positions, with a missing rate of 73% in aquaculture, 90% in public administration, 72% in academia/research, and 78% in other fields. Most veterinarians in these fields do not routinely perform euthanasia. Therefore, this lack of response was recoded to category '0–4', as this seemed to be the most likely reason for the high proportion of missing answers in these fields of work. After recoding, the proportion of missing data was 2.9% for this instrument, which is acceptable. Veterinarians' frequency of Euthanising animals was used as an exposure variable in research questions 2 and 3.

Confounders

The use of age intervals was encouraged by the Norwegian Centre for Research Data to keep collected data as unidentifiable as possible. Age was therefore reported in the following intervals: 20–25, 26–30 (…) up to 66–70, and > 70 years old. These age categories were entered as continuous variables in the regression models. Marital status was dichotomised into married/cohabitant and single/divorced/separated/widowed. Gender, age, and marital status were included as possible confounders in research questions 2 and 3.

In addition to gender, age, and marital status, the self-reported average number of working hours per week was used as a measure of workload in research question 3.

Attitudes towards euthanasia in humans could be a possible confounder for serious suicidal thoughts, as well as for euthanasia of animals. A previous study among veterinarians found a significant positive correlation between attitudes towards human euthanasia and suicide [7]. Although scarcely studied, veterinarians' positive attitudes towards euthanasia in humans may also influence attitudes towards animal euthanasia, possibly leading to a higher frequency of euthanasia of animals compared to the frequency among those with a negative attitude towards human euthanasia.

Therefore, attitudes towards euthanasia in humans were included as a possible confounder in research question 3.

Colleague support was measured using the mean of two questions: 'To what degree do you enjoy working with your colleagues?' and 'To what degree are you taken care of by your colleagues?'. Responses were given on a scale from 1 (not at all) to 7 (to a very high degree), as in previous studies [29, 30]. Cronbach's α for the two items on colleague support in our sample was 0.84. The mean scores of the two questions on colleague support were used in the regression analyses for research question 3.

Demographics

We received 2596 responses from 3464 participants (response rate: 75%). The most frequently reported age category was 41 – 45 years. Age varied between genders, with a higher proportion of younger women on the women's side, and 65% of the men being over 50 years of age.

In total, 70% of the participants were female, and 30% were male, which is an accurate reflection of the gender distribution of the total population of veterinarians in Norway (personal communication, Bente N. Reve, The Norwegian Food Safety Authority, 12 July 2021). The age distribution in our sample had only minor differences from the target population, according to the Norwegian Directorate of Health, which has an overview of all registered health personnel in Norway.

Additionally, rough estimates of the distribution between different fields of work in the NORVET study sample coincide with the major speciality associations in the Norwegian Veterinary Association, indicating that our sample is fairly representative concerning the distribution of fields of work as well. More details about the representativeness of the sample can be found in the doctoral thesis by Dalum [31]. A total of 139 (5%) veterinarians reported serious suicidal thoughts, a finding described in a past study [16].

Statistical analyses

Stata SE 17 was used for statistical analyses. The χ^2 test was used to test for differences by gender. Bivariate and multivariable logistic regression models were used to estimate the odds ratios (OR) for the associations between exposure and dependent variables. Initially, all variables were analysed bivariate with the dependent variable (crude OR).

Goodness-of-fit was tested by Pearson's goodness-of-fit test, and found satisfactory in all of the logistic regression models. The level of significance was set at 5% ($p < 0.05$). Two-way interaction terms between gender and the independent variables were entered to investigate gender-specific effects, with the main effect included in the model. Interaction terms were entered individually.

Overall, missing data across our dependent and independent variables was low (less than 4%). A missing-data analysis was performed for each of the independent variables in both regression models. With the exception of the high prevalence of missing data on the item on the frequency of Euthanising animals (see above), no other missing data trends were found.

Results

Table 1 provides a description of the sample.

Of the veterinarians in this study, 63% strongly agreed or partially agreed with the statement, 'Physician-assisted suicide should be permitted for persons suffering from a fatal disease with a short remaining life expectancy'. A total 55% strongly or partially agreed that 'Euthanasia should be permitted for persons suffering from a fatal disease with a short remaining life expectancy' and 51% strongly or partially agreed with the statement 'There are cases in

Table 1: Description of the independent variables in the present sample

Variable	Frequency (%) or mean value (SD)
Gender (*n* = 2552)	
Female	1776 (70%)
Male	776 (30%)
Age[a] (*n* = 2547)	
20–30	274 (11%)
31–40	697 (27%)
41–50	667 (26%)
51–60	432 (17%)
61–70	318 (13%)
> 70	159 (6%)
Marital status (*n* = 2514)	
Married/cohabiting	1962 (78%)
Single/divorced/widowed	552 (22%)
Main field of work (*n* = 2522)	
Companion animal practice	802 (32%)
Public administration	402 (16%)
Mixed clinical practice	268 (10%)
Academia/research	202 (8%)
Production animal practice	177 (7%)
Aquaculture	121 (5%)
Equine practice	102 (4%)
Other	250 (10%)
Pensioner	198 (8%)
Working hours (range 0–99) (*n* = 2293) Mean 41.6 (SD = 12.07)	
Serious suicidal thoughts (*n* = 139/2562) 139 (5.4%)	
Colleague support (range 1–7) (*n* = 2403) Mean 5.29 (SD = 1.38)	
Frequency of performance of euthanasia (*n* = 2350)	
0–4/week	2233 (95%)
5 or more/week	117 (5%)

[a] Age was reported in five-year categories. In Table 1, age distribution is showed in 10-year categories, to improve readability

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which it may be right/morally defensible for the doctor to provide assisted dying, even though it is illegal'. The statement, 'Assisted dying should be permitted also for persons suffering from an incurable chronic disease, but who are not dying,' had the lowest consensus (43%) (Table 2).

Agreement with all four questions was significantly higher among females than among males (Additional Table 1 – Veterinarians' agreement on assisted dying by gender).

Working in companion animal practice was independently associated with an increased likelihood of positive attitudes towards euthanasia in humans in the multivariable model (Table 3), with companion animal practitioners having 1.66 times higher odds of holding positive attitudes towards euthanasia in humans compared to veterinarians working in mixed clinical practice. Veterinarians' frequency of Euthanising animals was not independently associated with positive attitudes towards euthanasia in humans. Being younger and being single were also significantly associated with positive attitudes towards euthanasia in humans. We found a significant interaction between gender and marital status (OR = 1.94, 95% CI 1.18 – 3.23), indicating that single women have more positive attitudes towards euthanasia in humans than women with a partner.

Performing euthanasia more than five times per week was independently associated with a higher likelihood of serious suicidal thoughts in the multivariable model (Table 4). Veterinarians performing euthanasia five or more times per week had 2.56 times higher odds of having serious suicidal thoughts than those performing euthanasia four or fewer times per week. Being single, having a positive attitude towards human euthanasia, and low perceived colleague support were also significantly associated with a higher likelihood of serious suicidal thoughts. No interaction with gender was found.As there were differences in the relative prevalence of frequency of euthanasia between the different fields of work, we cross-tabulated the frequency of euthanasia with the field of work. This cross-table can be found as an additional file (Additional Table 2 – Cross-table frequency of euthanasia of animals and main field of work).

Discussion

A major finding of this study is that veterinarians' views on assisted dying in humans do not differ from those of the general population in Norway [32]. Working in companion animal practices was independently associated with positive attitudes towards euthanasia in humans, while veterinarians' frequency of Euthanising animals was not. Performing euthanasia more than five times per week was independently associated with serious suicidal thoughts compared to those performing euthanasia four or fewer times per week.

Knowledge regarding euthanasia acquired by veterinarians through their work does not seem to lead to a restrictive view of assisted dying in humans. This is in contrast to physicians, where restrictive attitudes towards assisted dying in humans have been shown in several studies [9, 12]. In our study, veterinarians had attitudes towards assisted dying comparable to those of the general population [32], and more liberal attitudes than physicians [12]. This trend is in line with a similar study in Sweden that included veterinarians, physicians, and the general population [9].

Overall, the prevalence of positive attitudes was significantly higher among female veterinarians compared to their male colleagues; however, no gender difference was found in the multivariable model. This is in line with a previous study, where no gender difference in attitudes towards assisted dying was found [9].

The reasons for these seemingly more liberal attitudes towards assisted dying in humans among veterinarians compared to physicians, despite veterinarians' knowledge and experience with animal euthanasia, are not known. This more liberal view among veterinarians may reflect a general trend in society, as acceptance of assisted dying in humans has increased in most Western European countries [33].

Also, the consequences of legalisation of assisted dying in humans would probably affect the role of the physicians very differently compared to veterinarians, as physicians would probably be more directly involved in patient cases than veterinarians would. This would probably also influence the responses given to this questionnaire among the two professional groups.

Table 2: Veterinarians' attitudes towards physician-assisted suicide and euthanasia in humans

Statement	Strongly agree, n (%)	Partially agree, n (%)	Neither agree, Partially disagree, nor disagree, n (%) n (%)	Strongly disagree, n (%)	Total, n
1. 'Physician-assisted suicide should be permitted for persons suffering from a fatal disease with a short remaining life expectancy.'[a]	805 (31.5%)	814 (31.9%)	318 (12.5%) 198 (7.8%)	420 (16.4%)	2555
2. 'Euthanasia should be permitted for persons suffering from a fatal disease with a short remaining life expectancy.'[a]	666 (26.0%)	738 (28.9%)	399 (15.6%) 252 (9.9%)	500 (19.6%)	2555
3. 'Assisted dying should be permitted also for persons suffering from an incurable chronic disease, but who are not dying.'[a]	414 (16.3%)	690 (27.1%)	545 (21.4%) 309 (12.1%)	590 (23.2%)	2548
4. 'There are cases in which it may be right/morally defensible for the doctor to provide assisted dying, even though it is illegal.'[a]	525 (20.6%)	787 (30.8%)	432 (16.9%) 243 (9.5%)	568 (22.2%)	2555

[a] The prevalence of positive attitudes was significantly higher among female veterinarians compared to their male colleagues in all four statements

Table 3: Variables associated with positive attitudes towards human euthanasia

	Crude		Adjusted	
	OR	95% CI	OR	95% CI
Female (ref. = male)	1.46*	1.21 – 1.75	1.02	0.82 – 1.26
Age	0.86*	0.83 – 0.89	0.87*	0.83 – 0.91
Single (ref. = having a partner)	1.38*	1.13 – 1.69	1.35*	1.10 – 1.67
Main field of work (ref. = mixed clinic* al practice)				
Companion animals	1.69	1.27 – 2.23	1.66*	1.23 – 2.23
Production animals	0.85	0.58 – 1.25	1.04	0.69 – 1.56
Equine practice	1.16	0.73 – 1.83	1.29	0.80 – 2.09
Aquaculture	1.10	0.71 – 1.69	1.07	0.69 – 1.67
Public administration	0.83	0.61 – 1.14	0.98	0.70 – 1.35
Academia/research	1.15	0.79 – 1.66	1.35	0.92 – 1.98
Other	0.96	0.68 – 1.36	1.07	0.74 – 1.53
Frequency of euthanasia (ref. 0–4/week)				
5 or more/week	1.42	0.95 – 2.11	1.32	0.88 – 2.00

N = 2222

**p < 0.05*

Working with companion animals was independently associated with positive attitudes towards human euthanasia. As our study is cross-sectional, we do not know if there is a causal relationship in this association. Further, this is a quite novel finding, and qualitative studies could elaborate further on the possible influence of animal euthanasia on veterinarians. Actually, veterinarians in companion animal practice have described viewing euthanasia as an 'act of compassion', in which the goal is facilitating a 'good death' [34]. This might be in contrast to the work of veterinarians working with production animals, where financial considerations would more often lead to animals being slaughtered and not euthanised. The role that these factors might play in attitudes towards euthanasia in humans needs further exploration.

Table 4:Variables associated with serious suicidal thoughts
From: Euthanasia of animals – association with veterinarians' suicidal thoughts and attitudes towards assisted dying in humans: a nationwide cross-sectional survey (the NORVET study)

	Crude		Adjusted	
	OR	95% CI	OR	95% CI
Female (ref. = male)	1.55	0.999 – 2.401	1.30	0.78 – 2.18
Age	0.93	0.86 – 1.00	0.95	0.86 – 1.04
Single (ref. = having a partner)	2.38*	1.65 – 3.43	2.11*	1.42 – 3.15
Positive attitudes towards euthanasia in humans (ref. = disagree/indecisive)	2.68*	1.79 – 4.02	2.00*	1.29 – 3.09
Working hours	1.00	0.99 – 1.02	1.00	0.99 – 1.02
Main field of work (ref. = mixed clinical practice)				
Companion animals	1.38	0.74 – 2.57	1.39	0.69 – 2.81
Production animals	1.28	0.56 – 2.94	1.57	0.62 – 3.95
Equine practice	1.21	0.45 – 3.28	1.40	0.48 – 4.07
Aquaculture	1.01	0.37 – 2.73	1.20	0.42 – 3.42
Public administration	1.08	0.53 – 2.20	1.43	0.63 – 3.21
Academia/research	1.12	0.49 – 2.56	1.24	0.49 – 3.11
Other	0.82	0.35 – 1.91	0.88	0.34 – 2.33
Colleague support	0.64*	0.57 – 0.71	0.63*	0.56 – 0.72
Frequency of euthanasia (ref. 0–4/week)				
5 or more/week	2.48*	1.38 – 4.46	2.56*	1.35 – 4.87

N = 2083

**p < 0.05*

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Veterinarians' frequency of Euthanising animals was not independently associated with positive attitudes towards human euthanasia. Again, the cross-sectional design hinders any conclusions regarding causality, however, it may suggest that it is not the euthanasia caseload that affects veterinarians' attitudes, but rather their knowledge and experience of the euthanasia process. Qualitative studies would be a feasible approach to gain a deeper understanding of the possible influence and interplay of different work-related factors on attitudes towards death among veterinarians, and to explore whether veterinarians' view on death is associated with the high suicide rate seen in the profession.

Being younger and being single were also significantly associated with positive attitudes towards euthanasia in humans. This is in line with a recent systematic review that found that being younger and being divorced or being widowed predicted higher endorsement of assisted dying [35].

Performing euthanasia five times or more per week was independently associated with serious suicidal thoughts. A systematic review including 12 papers reported that performing euthanasia may generate traumatic stress and decrease the well-being of animal care workers [36]. Furthermore, several studies have shown that euthanasia is a source of moral and job stress [37–39], while another study did not find a significant relationship between euthanasia and psychological distress or compassion fatigue [40]. Veterinarians have emphasised the lack of sufficient training in euthanasia-related decision-making and euthanasia consultations [34, 38, 40], as they are also responsible for managing animal owners' grief, guilt, and loss during euthanasia consultations [41]. Our findings suggest that Euthanising animals may be an occupational stressor.

This should be further investigated, especially with respect to its potential contribution to suicide risk. A normalisation or possible habituation process through exposure to animal euthanasia would be in line with one of the three constructs of the interpersonal theory of suicide, namely the acquired capability of suicide [42]. According to the authors, habituation to the pain and fear of suicide may be method-specific and acquired through exposure [42]. The authors exemplified this by presenting the preferred method of suicide in different occupations, i.e., guns in the army, hanging or knots in the navy, and falling or heights in the air force. Such habituation may be especially relevant for veterinarians working in companion animal practice, but further research is needed to elaborate on the role of animal euthanasia in suicide risk among veterinarians. Also, due to the cross-sectional design of our study, we do not know the direction of the association found. Cognitive bias among veterinarians with serious suicidal thoughts cannot be ruled out, possibly leading to an over-reporting of the frequency of animal euthanasia. A previous study from Norway found that veterinarians had a relatively high prevalence of mental health problems in need of treatment [43].

It is known from previous research that depression may lead to an overestimation of negative events, due to cognitive bias [44]. Moreover, positive attitudes towards euthanasia in humans were independently associated with serious suicidal thoughts among veterinarians. Although different measures were used, our findings may support a previous study that found a significant positive correlation between attitudes towards human euthanasia and suicide among veterinarians [7].

Being single was associated with serious suicidal thoughts among veterinarians, consistent with previous findings [24, 27]. Perceived support from colleagues was associated with a reduced likelihood of having serious suicidal thoughts. Traditionally, veterinary work has been an occupation with more professional isolation than other medical professions, especially in rural areas. In fact, professional isolation and a lack of social support have been emphasised as risk factors for suicide among veterinarians [23]. Interventions to strengthen collegiality and facilitate colleague support networks could be an important aim for preventive mental health measures for veterinarians at the organisational level.

Among veterinarians, a register-based study found that when excluding decedents with pentobarbital poisoning, the standardised mortality rate for suicide was not significantly different from that of the general population [2]. Restriction to means has previously been highlighted as an important strategy for suicide prevention [45], and the secure storage of euthanasia solutions has been proposed as a method for addressing veterinarian suicide [46]. Euthanising animals is a routine occupational task for veterinarians. Their experience in decision-making regarding 'the right time' to euthanise may render veterinarians with suicidal thoughts especially vulnerable to suicide by self-poisoning. Indeed, a recent study found that among veterinarians with suicidal ideation in the past week, easy access to lethal medication in their workplace was associated with a six-fold increase in the perceived likelihood of a future suicide attempt, compared to those locking away lethal medication during business hours [47]. Our findings coincide with a recent study that suggests that performing euthanasia affects veterinarians' attitudes towards suffering, or towards alleviating suffering through death [6]. As self-poisoning is the most commonly used method for suicide, addressing this as an occupational hazard for suicide among veterinarians seems appropriate. Suicide is a multifaceted phenomenon with a complex aetiology, and a dozen risk factors have been described [48]. Therefore, no single factor, such as animal euthanasia, will explain suicidal thoughts or suicide among veterinarians.

To our knowledge, this is the only nationwide study among veterinarians investigating the association between animal euthanasia and serious suicidal thoughts, and between animal euthanasia and attitudes towards euthanasia in humans. A major strength was the study's high response rate (75%), which made multivariable analyses feasible, while reducing the possible effects of selection and response biases. The questionnaire was quite comprehensive and included several relevant individual and work-related variables for the multivariable statistical models. This is an asset, since we know that explanation of both human attitudes and suicidal thoughts can be multifaceted and complex. An important limitation is the cross-sectional design, restricting conclusions regarding causality. Additionally, this being a self-report study introduces the possibility of recall bias. The generalisability of our results may also be limited. Nevertheless, we believe that our findings are representative of veterinarians in Northern Europe. The study was conducted during the Coronavirus pandemic,

which may have affected the results. The survey was planned before the pandemic, and any potential effects (e.g., redundancies and economic effects in the practices) were not accounted for. We did not control for religious views in our study, which could be a possible confounder with regard to attitudes towards assisted dying and serious suicidal thoughts.

A challenge with the instrument on attitudes towards assisted dying is that, although we included definitions of the different terms in the questionnaire, the statements and response alternatives leave room for interpretation. For example, 'short remaining life expectancy' was not defined, nor were 'suffering' or 'fatal disease'. Also, the response categories were not strictly defined. When using this instrument, we dichotomised the responses as in previous studies, assuming that the respondents were either in favour of or opposed to assisted dying. Specific regulations of assisted dying would probably influence attitudes towards the statements given in the questionnaire. Those responding 'partially agree' or 'partially disagree' could be receptive to arguments either in favour of or against the legalisation of assisted dying. Therefore, a relatively large proportion of veterinarians are unlikely to hold an extreme attitude in favour of or against legalisation but may be willing to change their minds in different circumstances. This may have reduced the reliability of this measure. When measuring veterinarians' frequency of Euthanising animals, '0' should have been a separate category, instead of its being grouped with 0–4 per week. Further, we did not define animal euthanasia. It may be that non-justified and absolutely justified animal euthanasia would have yielded different results. This may have reduced the validity of this measure. However, we were able to distinguish between those with a low case-load (0–4/week) and those with a high case-load (5 or more/ week). There is a possibility that there is a confounding variable affecting both serious suicidal thoughts and veterinarians' frequency of Euthanising animals that we have not accounted for in our study. Therefore, a possible association between Euthanising animals and serious suicidal thoughts should be validated in other representative veterinarian samples in the future.

Conclusions

Veterinarians' attitudes towards assisted dying in humans did not differ from those of the general population. Veterinarians' frequency of Euthanising animals was not associated with positive attitudes towards euthanasia in humans. However, veterinarians working with companion animals were more likely to have positive attitudes towards euthanasia in humans. Moreover, euthanising animals five times a week or more was associated with serious suicidal thoughts. Therefore, veterinarians with suicidal thoughts may benefit from not working with euthanasia. Our study is the first nationwide survey investigating the association between animal euthanasia, attitudes to assisted dying and suicidal thoughts among veterinarians. Therefore, our findings should be validated in other veterinary populations. Qualitative studies could further elaborate on the role of animal euthanasia on veterinarians' suicide risk, as well as on attitudes towards assisted dying and death, and a possible interplay between these factors. For instance, interviews with veterinarians with a history of suicidal thoughts or suicide attempts would be beneficial to explore whether occupational experience with animal euthanasia affected the suicidal process. The role of euthanasia as an occupational risk for suicide among veterinarians should also be further assessed in prospective studies, both in terms. V

References available on request

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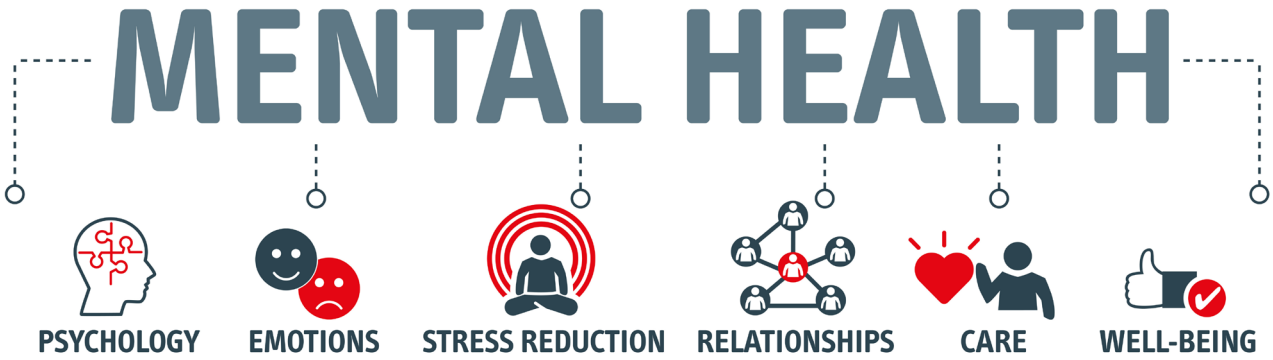
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We, the members of the Association, resolve at all times:

- To honour our profession and the Veterinary Oath
- To maintain and uphold high professional and scientific standards
- To use our professional knowledge, skills and resources to protect and promote the health and welfare of animals and humans
- To further the status and image of the veterinarian and to foster and enrich veterinary science
- To promote the interests of our Association and fellowship amongst its members.

Ons, die lede van die Vereniging, onderneem om te alle tye:

- Ons professie in ere te hou en die Eed na te kom
- 'n Hoë professionele en wetenskaplike peil te handhaaf en te onderhou
- Ons professionele kennis, vaardigheid en hulpbronne aan te wend ter beskerming en bevordering van die gesondheid en welsyn van dier en mens
- Die status en beeld van die veearts te bevorder en die veeartsenykunde te verryk
- Die belange van ons Vereniging en die genootskap tussen sy lede te bevorder.



Psychological implications of humane endings on the veterinary profession

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ABSTRACT

The veterinary profession has a unique responsibility to animals during the final stages of their lives. The veterinarian's obligations extend to humane endings, involving all species of animals in a range of circumstances including, but not limited to, euthanasia of individually owned animals, euthanasia of animals for research purposes, depopulation of animals during emergencies, and slaughter of animals raised for food. The veterinary profession continues to improve animal welfare through advances in end-of-life decision-making and humane killing techniques,[1–3] but the psychological impacts on veterinarians have not received the same level of consideration.

Building on the influential AVMA Humane Endings Guideline, the AVMA recognizes that support for the mental health of veterinarians engaged in such activities needs to be a priority. This article aims to provide the foundation and rationale for improved preparation and establishment of sustainable mental health resources and to offer recommendations on pragmatic solutions to support and prepare veterinary professionals as leaders impacted by participation in humane endings–related activities. While end-of-life decision-making and implementation may present mental health challenges to veterinarians, it is crucial to recognize that there are stressors specific to each situation and that every individual's experience is valid. Addressing the mental health issues surrounding the decision-making process and implementation of humane endings activities start with a comprehensive understanding of each activity's unique context and the veterinarian's leadership role. Therefore, this article highlights the psychological impact of depopulation and its similarities and exclusive challenges compared with euthanasia and humane slaughter.

An Overview of AVMA Humane Endings

Introduction

Veterinarians are empowered to deliver euthanasia in a compassionate manner with a goal to create a peaceful and meaningful experience for owners.[4] Most of the research to date has focused on the impact of euthanasia on the mental health of veterinarians in a clinical practice setting and on the human animal bond of the owner with their pet.[5]

There is also a significant proportion of veterinarians who work in other sectors of the profession and whose jobs also involve the euthanasia, slaughter, or depopulation of animals. These smaller communities include (but are not limited to) veterinarians that work in zoo, shelter, aquatic, wildlife, equine, livestock, poultry, and laboratory disciplines, as well as others engaged in governmental oversight and regulations—all of whom are greatly outnumbered by small animal practitioners within the US.[6]

This can lead to feelings of isolation, being misunderstood, and potentially being unprepared to deal with the unique mental health challenges of their chosen fields.

Regardless of the species of animal and setting, moral conflict for veterinarians around the topic of humane endings arises when the practical realities of a situation interfere with the potential live outcome for an animal. The psychological impacts of this conflict are compounded by external pressures to "save" every animal and differing views on consumption of animals[7] and their use for biomedical research and advancement of scientific knowledge.[8] These pressures may come from society, members of the local community, clients, and colleagues.[9] Likewise, moral conflict can occur among veterinarians for a variety of reasons, such as euthanasia of animals for experimental outcomes, depopulation of an entire flock or herd due to highly pathogenic avian influenza zoonotic risks, or euthanasia of otherwise healthy animals due to a lack of capacity to care for unowned companion animals. Additional strain can occur when personnel form strong attachments to the animals throughout their time working with them in these various environments.

Whether humane ending activities are related to euthanasia of individual animals, slaughter of animals for human consumption, or rare emergency situations warranting depopulation of a group, it is often the veterinarian's responsibility to oversee and conduct these humane endings. In addition, the veterinarians may be relied on to provide support to other personnel and communicate with external stakeholders throughout these processes. Therefore, this Viewpoint article aims to review the history of the AVMA Humane Endings guidelines; explore factors that can influence the psychological impacts of engaging in activities related to euthanasia, slaughter, or depopulation; and discuss actionable steps individual veterinarians and the profession as a whole can take to improve mental health outcomes for our colleagues.

History of AVMA guidance documents

During discussions on the 2013 revision to the AVMA Guidelines for the Euthanasia of Animals,[1] it became clear that currently recommended euthanasia methods might not always translate to animals killed for food and fibre or to emergency situations where hundreds to thousands of animals may need to be killed in a short timeframe. In the context of euthanasia, the veterinarian's prima facie duty in carrying out euthanasia includes (1) their humane disposition to induce death in a manner that is in accord with an animal's interest and/or because it is a matter of welfare and (2) the use of humane techniques to induce the most rapid, painless, and distress-free death possible. These conditions, while separate, are not mutually exclusive and are co- dependent.

However, there are certain situations in which meeting criteria for euthanasia is not appropriate or feasible.[1] This realisation led to the challenging task of developing the Humane Slaughter (2016)[2] and Depopulation Guidelines (2019)[3] that provide expert guidance on these unique situations. To develop the Guidelines for the Depopulation of Animals, the AVMA convened an exhaustive panel of subject matter experts, including an ethicist. To ensure comprehensive feedback from the veterinary profession was considered, AVMA members were invited to review and comment on the draft documents during a 90-day comment period.

This resulted in hundreds of comments reviewed and reconciled by the Panels for their guidance documents prior to their official public release. New data and literature are collected and continuously reviewed by the Panels, and updates are made to the Guidelines as needed.

Depopulation

Depopulation is a process marked by quick and efficient destruction of a complete population of animals in response to urgent circumstances, with as much consideration given to the welfare of the animals as practicable.[3] These situations can affect all species, including production animals, wildlife and equids, research animals, and companion animals. It is important to note that the AVMA Guidelines for the Depopulation of Animals: 2019 Edition preferentially recommend using euthanasia or slaughter methods if circumstances permit, but in an emergency circumstance, those methods may not be practical or possible. Since depopulation involves the mass termination of an entire population of animals within a short time period, the use of euthanasia methods is not always possible.[1,3] Likewise, these emergency methods may not be congruent with humane slaughter, as the purpose of depopulation is not necessarily for consumption or use, and depending on the emergency circumstances, resources may not allow for the use of slaughter methods.[2,3]

The directive to depopulate can originate from a predetermined regulatory action, governmental body, or facility overseeing the care and use of animals. In these situations, veterinarians can be left with limited time and outside assistance to meet any regulatory requirements, which further compounds the burden of responsibility during these depopulation events. To make these situations even more challenging, the emotional burden does not solely exist with the veterinarian and their immediate staff, but likely includes the animals' owners, caretakers, and others who potentially might assist with the handling of animals during the depopulation situation. Altogether, these various pressures (number, time, healthy animals, emotional status of the owners, public support, media coverage, and the disaster itself) lead to a tremendous burden on the physical, mental, and emotional status of the veterinarians in charge, which, if not addressed, can lead to damaging psychological impacts.

Current Status of Humane Endings and Veterinary Mental Health

What we know

Veterinary and other animal-related professionals often have strong feelings and opinions about humane endings. Many consider euthanasia a gift; the ability to end an animal's suffering by providing a "good death." Yet the act of ending animal life can often be imbued with both the moral complexity of the killing-caring paradox and significant emotional labour. Veterinarians and other animal-related professionals face the killing-caring paradox when they must euthanise an animal for which they have provided health care and/or animal husbandry.[10] Emotional labour can be defined as the challenges associated with managing one's emotions to meet the requirements of a job[11]—a frequent challenge faced by veterinary professionals. While both elements are commonly witnessed when euthanasia is conducted, they offer unique challenges to those engaged in humane slaughter and depopulation efforts.

Although the human-animal bond is typically used in reference to companion animals, there is no doubt that this bond can develop with any animal, and production animals intended for slaughter and animals in a research setting are no exception.[12]

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The magnitude of an individual's bond with an animal may vary based on species, life span, housing system, or production system.[13] Despite raising these animals to eventually be killed, caretakers are committed to ensuring animal welfare for the duration of their lives.[13] The loss of these animals may cause individuals to safeguard their emotions by avoiding a bond with them in the first place.[14]

The culmination of the emotional labour and the moral complexity of the killing-caring paradox during depopulation events can result in painful psychological impacts for veterinary and other animal-related professionals.[15] Since these situations inherently involve death, they meet the criteria for what the *Diagnostic and Statistical Manual of Mental Disorders* considers "trauma"—that is, "exposure to actual or threatened death, serious injury, or sexual violence in one (or more) of the following ways: directly experiencing the traumatic event(s); witnessing, in person, the traumatic event(s) as it occurred to others; learning that the traumatic event(s) occurred to a close family member or close friend."[16] Additionally, since depopulation involves veterinarians and other animal-related professionals actively engaged in the killing of animals, the experience can be described more precisely as perpetration-induced traumatic stress (PITS).[17] Perpetration-induced traumatic stress is an important construct to understand because it helps us understand that people can have PTSD symptoms as a result of perpetrating trauma as opposed to being the victim of trauma.

The symptoms of "traditional" PTSD and PITS are similar—it is the cause of the distress that is the important distinction. In other words, knowing that people could experience PTSD by causing harm or trauma to others in ways similar to if they experienced the trauma themselves can help us identify appropriate interventions. Hence, PITS can have a grave impact on the mental health of those involved by eroding the positive sense of identity they have as animal caregivers and stewards.[18] Symptoms as a result of this traumatic stress include intrusive unwanted thoughts and images, nightmares and difficulty sleeping, trouble concentrating, hyperarousal (such as increased startle response), and avoidance or numbing of upsetting stimuli (especially through the use of substances to mask unpleasant emotions and memories).[19] There are also often feelings of shame and guilt associated with moral injury—the emotional and mental effects of engaging in a behaviour that goes "against the grain"—in this case, being a caregiver for animals.[20]

Not everyone who engages in depopulation has significant, longstanding emotional trauma. There are several factors that mediate how moral complexity and emotional labour of depopulation impact psychological health. This includes internal factors, such as personality, temperament, preexisting trauma, and cognitive factors, and external factors, including the context of the animal death and separate personal and global circumstances, which also contribute to psychological stress.

Personality and temperament

Personality styles impact how individuals interact with and experience their environment. One commonly used personality model is the Big Five personality traits. These 5 traits include openness to experience, neuroticism, extraversion, conscientiousness, and agreeableness. Research suggests that individuals with higher levels of neuroticism (increased sensitivity) tend to experience more mental distress than those with lower levels,[21] including an increased tendency to develop posttraumatic symptomatology after a traumatic event.[22] Another trait that appears to impact how one is impacted by trauma is sensory processing sensitivity.[23]

Also referred to as environmental sensitivity, people with this trait have increased awareness and sensitivity to their environment and often respond to external stimuli more deeply on both cognitive and emotional levels. These individuals are likely to spend more time reflecting, ruminating, or brooding on the experience instead of using distraction or cognitive reappraisal (the ability to reframe challenging situations in a more positive light) as coping mechanisms. Additionally, situational stressors, as well as current global factors and an individual's prior history of stress and trauma, all impact how one is affected by the moral complexity and emotionality of depopulation.

Preexisting trauma and cognitive factors

Approximately 60% of the US population has experienced at least 1 adverse childhood experience.[24,25] Examples of adversity in childhood include a parent with a mental illness, parental divorce or separation, or physical, sexual, or emotional abuse or neglect. As traumatic experiences accumulate in a person's life, there is an increased likelihood of worse mental and physical health outcomes. The presence of developmental or adult-onset trauma predisposes people to experience prolonged traumatic stress after a traumatic event. "Dirty work," defined as jobs likely to be perceived as disgusting or degrading, often falls to people who are marginalised.[26] These are the same groups more likely to have suffered earlier trauma and challenging life situations.

These factors should be considered when assigning individuals to varying roles in depopulation efforts. It is important that they be invited to consider and respect their own trauma history factors and be given options for participating in roles the individual deems they are able to carry out safely; doing this, as well as offering psychological assistance, can mitigate further psychological harm to these individuals who may be at higher risk.

Context

The context in which depopulation occurs can also influence the psychological impact for those involved. Contextual issues (such as [1] the reason the depopulation is occurring; [2] the nature of the relationship between the involved parties and the animals; [3] instrumental factors such as urgency, access to recommended methods for depopulation, proper training in implementation of methods; and [4] public response, including the role of social media) all influence the potential detrimental impact of involvement in depopulation efforts.

The rationale behind a decision to depopulate is critically important to those involved. Research exploring resilience among military personnel has shown that the ability to find meaning, for even the most traumatic parts of war, can be helpful in preventing and recovering from trauma.[27] This has direct implications for depopulation efforts. It is easier to find meaning in depopulation aimed at reducing animal suffering; it is more challenging to find meaning in the necessary killing of healthy animals, as in the case of what was required in response to COVID-19's effect on meatpacking plants. This challenge is not unique to food animals and can also apply to research laboratory environments. Better messaging related to the need to sometimes kill healthy animals, whether it is due to disease contagion or other uncontrollable elements such as

natural disasters or COVID-19, is important in helping to mitigate negative psychological effects for those directly involved. The relationship or bond between the animal and the person who is depopulating is also important. In laboratory animal environments, rotation of duties has been employed to try to mitigate the psychological impact of depopulation by helping create emotional distance between involved animals and people. For instance, the identification of which animals must be euthanised and the performance of the task may be assigned to different people.

Similarly, attachment to the animals is a consideration in the food system. Female caretakers of piglets on sow farms, for example, have more difficulty with euthanasia than those working in finishing units.[28] Many of those involved with depopulation efforts have a longstanding, financially and emotionally complex relationship with the impacted animals. Attention to this relationship is an important factor to consider when trying to mitigate the negative psychological effects of depopulation.

Additional factors such as time pressure, access to preferred humane killing methods, and adequate training for implementing these methods can impact psychological responses by limiting caregivers' ability to emotionally prepare. In emergency depopulation of animals due to animal or public health crises, there is often a need to act immediately. This can negatively impact the ability of those involved to engage in pre-emptive self-care and regulation of thoughts and emotions. Even in situations where euthanasia is a necessary and expected part of the process, such as within research laboratory environments, timing and training are important factors to consider when supporting the people involved.

The animal food system has unique challenges, however, in that although it is expected that there will be disease outbreaks or other disasters that require depopulation, the unpredictable nature of these events can make managing the psychological impact difficult. Ensuring that the people involved have the appropriate tools for implementation and adequate training (including detailed information about the process and what to expect) is critically important to help protect their psychological health. Times of imminent need for action, a lack of adequate resources to implement recommended depopulation methods, or both add complexity to a depopulation effort. Planning and training for these types of emergency situations, for both veterinary and other animal-related professionals, can be of benefit.

Lastly, the potential negative impact of public opinion and social media on those directly involved with depopulation cannot be overstated. The stress of making difficult depopulation choices is often compounded by a lack of understanding and judgment by those not involved.[29] This can make individuals reluctant to seek out social support, a well-known and important tool for coping with difficult experiences. Depopulation is a complicated topic, one that friends, loved ones, and even other veterinarians may not understand or may have strong negative views about. As a result, many people directly involved in depopulation may feel unable to reach out to those close to them for emotional support. For those who do, all too often these interactions can be demoralising, painful, and ostracizing[30], exacerbating the risk of feeling guilt and shame. Similarly, negative social media related to depopulation efforts can result in increased likelihood of trauma-related stress, psychological distress, and even fear related to one's own physical safety. Incidents in which veterinarians and other animal-related professionals involved in depopulation efforts have been threatened or harassed are common.[28,30]

Call to Action

Overview

As one can see, the veterinary profession is at a turning point related to the psychological impacts of humane endings that have accelerated with the COVID-19 pandemic. This has highlighted the need to address what current resources are available to help those involved in euthanasia, slaughter, and especially depopulation of animals (e.g., veterinarians, people performing humane killing methods, and people losing the animals) as well as various questions, including who is currently and actively addressing these issues, what current research is being performed, and why we, as veterinarians, need to support and invest in this issue. With a bold approach and open heart, the veterinary profession can address these issues and help create a safe space with open dialogue for veterinarians who have historically felt misunderstood by their fellow colleagues to actively support one another. Addressing the negative stigmas, increasing internal support through a cohesive veterinary profession, creating practical resources to prepare veterinarians for humane endings activities, increasing the depth of related education in the veterinary curriculum, and leveraging support from mental health professionals are keys to the psychological well-being of all veterinarians.

Address negative stigmas

For production animal veterinarians, society has expectations of having access to meat and dairy products that are safe, affordable, and readily available. There is a disconnect and general lack of knowledge among the public about where these products come from and what it takes to produce the food. In addition, there needs to be a general understanding, public education, and widespread acceptance of the necessity of increased prices that may come from the improvement in animal welfare. We need a safe place for production animal veterinarians to be recognised for their contributions to keeping the animals healthy and enhancing their welfare; recognition is necessary for the day-to-day work that is required to care for vast herds and flocks of production animals and the management of workers who assist with the care and well-being of these animals. Similarly, for laboratory animal veterinarians, there is a stigma and a misperception among the public. The public needs to have access to accurate information about the value of animal models and their association with new therapeutics and scientific discoveries.[31] The current pandemic is a prime example of the value of animal models in responding to global diseases. Decades of research with animal models have contributed to the rapid response and development of vaccines and therapeutic treatments[32] that have saved countless human and animal lives. As stated in the veterinary oath, veterinarians have a shared commitment to enhance society by protecting animal health and considering the larger concept of public health, wellness, and advancing medical knowledge. The question then becomes, how do we unify the profession to better support one another during challenging times associated with humane endings?

Foster well-being through increased cohesiveness of the veterinary profession

Veterinarians, by nature, tend to empathise with people as well as other animals.[33] They are hardwired to come together to help others during times of need. For example, there are organisations[34,35] dedicated to supporting the mental health of veterinarians through

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peer veterinarians who understand the struggles they endure, such as coping with end-of-life choices for the animals in their care. Bringing awareness that other animal health professionals share in the same struggles of depopulation and need support[36] may cause veterinarians to ask, "What can I do?" These individuals can unify to embrace the mission of promoting the mental health and well-being of all individuals who work with animals.

This effort requires building bridges and cultivating compassionate awareness across all veterinary contexts, whether it involves humane endings in a clinic, a research institution, or a farm. We, as a profession, can accomplish this by bringing awareness to the industry leaders and the public, as well as building resources for animal professionals.

These efforts are supported by the work of the AVMA volunteers and staff concerned with animal welfare, animal and public health, and government relations. Together, these efforts can lead to improvements in one health and one welfare and a better understanding of veterinarians working in the numerous sectors of the profession.

Provide practical resources to support veterinarians

One concrete way to reduce negative psychological impacts on veterinarians is exploring ways to improve the welfare of all animals, including at the end of their lives. The AVMA's Humane Endings Guidance documents[2–4] provide structure and support for preparation, decision-making, and implementation of euthanasia, slaughter, and depopulation of animals. Likewise, the AVMA's Steering Committee on Human-Animal Interactions created the Psychological Impacts of Humane Endings Working Group to provide a more focused approach to meeting the needs of veterinarians impacted by euthanasia, slaughter, and depopulation events.

The practical resources and information created by the AVMA will be shared at a variety of continuing education conferences and through online platforms, including AVMA Axon and the AVMA's Humane Endings Symposia. Symposia like this encourage cross-context emphasis, sensitise the veterinary community to different realms of veterinary medicine, and allow an open dialogue within our community about the psychological challenges facing many in our profession. The 3rd Humane Endings Symposium, scheduled for January 2023, will continue to hold space for productive conversations around methods and caring for those engaging in these activities.

Education in veterinary curricula and the clinical setting

US urbanisation continues to increase, and since 1900, most people live in urban settings where children grow up without experiencing farm animals.[37] Some children gain experience with animals in 4H and Future Farmers of America (FFA), with membership in FFA growing faster than student populations.[38] Informing children about sources of their food and efforts to improve the welfare of farm animals is important. Thus, the continued support of some background in animal science is encouraged for individuals interested in the veterinary profession.[39]

Likewise, exposure of students at a young age to animals in research and comparative medicine has the potential to increase acceptance of animals' utilisation in research as well as positive views on biomedical research and competence.

Veterinary education related to humane endings can help meet the Council of Education accreditation requirements under section 7.11, standard 11. These competencies include anaesthesia and pain management (patient welfare), ethical and professional conduct (communication), emergency and intensive care case management, and critical analysis. However, current practising veterinarians report that the number of hours of euthanasia training delivered over the course of the US veterinary curriculum is insufficient,[40] and the same is likely true of depopulation, slaughter, and other humane endings topics. These limited hours are largely dedicated to the technical delivery of humane endings and may only briefly mention the impact on the veterinarian's mental health. There is little room to comprehensively address the vast subject of humane endings in the standard veterinary curriculum, including in the clinical years. This education should be prioritised under the directive that curricula continuously develop in the context of ever-changing societal expectations.[41] Education and training should also bring awareness that individuals other than veterinarians commonly perform depopulations and humane slaughter, and must acknowledge the need for improved training for these activities and the impact that they have on the mental health and well-being of other animal health professionals.[42] To achieve the core competency of promoting the health and safety of people,[43] veterinary educators' responsibility should include directing these individuals to the appropriate mental health resources.[36]

Education in the mental health professions

Education in the social sciences pertaining to the mental health needs of those involved in euthanasia or depopulation is still in its infancy. The Veterinary Social Work program at the University of Tennessee[44] offers graduate and postgraduate certificates to mental health and animal-related professionals that can be earned primarily online. It provides one health–focused interdisciplinary education on the human needs that arise at the intersection of social work and veterinary practice. Program content includes education about grief and loss, compassion fatigue, and the moral stress associated with euthanasia, as well as depopulation.

Certificate programs and undergraduate and graduate degrees related to human-animal interactions are still relatively uncommon, and most focus on animal-assisted therapy (e.g., Oakland University's Animal-Assisted Intervention[45] and the University of Denver's Equine-Assisted Mental Health Practitioner Certificate Program).[46] Many of these programs, such as the one in Animals and Society at the University of Colorado,[47] include elements of ethical and moral concerns, yet none have a primary focus on how to help support veterinary professionals with the challenges of euthanasia and depopulation.

When looking at more traditional undergraduate and graduate programs in psychology, social work, and counselling, there are numerous examples of programs that focus on grief and loss counselling related to human loss.[48] These programs that teach mental health professionals how to support people coping with grief, loss, bereavement, and trauma could easily be adapted to encompass the needs of veterinary professionals. Another avenue for educating professionals to help veterinarians could be to make modifications in current pet loss grief support certifications.[49] As their name implies, these programs focus on how to support pet owners; however, many of these techniques and skills could be modified to address veterinary professionals. For example, helping people navigate the complexities of the decision-making process

involved in euthanasia and depopulation, as well as the moral injury that often accompanies such decisions, is an aspect in which pet loss counsellors could be trained.

In summary, there are numerous avenues in which the pipeline to train mental health professionals to help support veterinarians with end-of-life issues could be expanded. Recognition of the mental health needs of veterinary professionals and support by major organisations in both the veterinary and mental health fields (e.g., AVMA, American Psychological Association, National Association of Social Work) are essential in making advances in this critical aspect of helping veterinary professionals.

Conclusion

Humane endings are a critical but often overlooked aspect of the veterinary profession involving thought-provoking, often emotional deliberations and challenging ethical dilemmas, which spurred this coalescing of experts to write this Viewpoint article. Special emphasis was given to production animal medicine and laboratory animal medicine. These fields consistently grapple with the emotional toll and impacts of all those involved in slaughter, mass euthanasia, and depopulation events.

It is essential that the veterinary profession and animal health industry recognise and work to address the psychological impact of humane endings.

The AVMA has historically initiated and continues to lead the charge on the various issues and difficulties surrounding the delicate topic of humane endings. The conversation has been supported by the AVMA Humane Endings Symposia, which bring together experts and individuals who have firsthand experience with depopulation events and mass euthanasia and understand the nuances of the ethical and moral dilemmas and issues arising from this multifaceted and challenging topic. Overall, through ongoing leadership from the AVMA, these efforts will keep expanding through continued enhancements to humane endings guidance documents, creation of better tools and resources, and taking the necessary steps to acknowledge the associated psychological impacts on the veterinary community. These difficult discussions must continue as we attempt to unify our profession and to have an open and honest dialogue on humane endings. V

References available on request

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DEADLINE: 31 JULY 2026

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Awarded to one veterinarian registered with the SAVC per year, younger than 35 years of age or who has not been registered for longer than 10 years and who has made a significant contribution to veterinary science in his / her work sphere.

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Awarded in recognition of exceptional community service rendered by a veterinarian registered with the SAVC or a veterinary student enrolled at a South African veterinary faculty. In addition to veterinary-related services, other forms of community service may be considered to support the nomination.

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The SAVA may bestow a citation upon one or more persons, including non-veterinarians, in recognition of specific achievements and / or meritorious contributions to the veterinary profession or the SAVA. More than one citation may be bestowed per year.

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All nominations must be supported by:

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- A brief motivation in terms of the conditions of the specific award, including the impact the work of the nominee has had. Evidence supporting the motivation, such as testimonials, may be included.
- A full *curriculum vitae* of the nominee, including a list of publication(s) where applicable and all the contact details of the nominee.
- Copy (ies) of the relevant publication(s) in the case of the Research Award.
- It should be clearly understood that all SAVA Awards are conferred for contributions that have been made specifically in a South African context and not elsewhere.

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- Non-SAVA members may be nominated for all categories except the Boswell Award and Honorary Life Membership.
- Unsuccessful nominations of previous years may, at the discretion of the Awards Committee, be held over for consideration in the following year.
- Where the nominator and seconder have indicated their permission, award categories of nominations could be changed by the Awards Committee.
- Members of the Awards Committee are permitted to propose or second candidates for awards, on condition that they recuse themselves when such nominations are discussed.

The onus is on members to submit appropriate nominations by the due date.

Failure to comply with the above will lead to disqualification of the nomination.

All nominations, in electronic format, marked for the attention of Prof G Bath, Chairperson, Awards Committee of the SAVA, must reach the SAVA office, Debbie Breeze by

FRIDAY, THE 31ST JULY 2026

Nomination forms may be obtained from Ms Debbie Breeze 012 346 1150 or please send an email to debbie@sava.co.za

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Greetings, everyone. I hope that it has been a wonderful and re-energising first quarter of 2026! Time can feel like it's speeding up—clinic days blur together, textbooks and emails pile up, and that long list of professional goals seems to recede into the distance.

For veterinary professionals, the pressure is real: patient care, client communication, continuing education, practice management tasks, and personal life all compete for attention. It's easy to feel behind when milestones slip and distractions multiply.

The good news is that there are practical, compassionate strategies to help you pace yourself, reduce overwhelm, and—importantly—recognise and celebrate the progress you make.

Recognise the reality: speed is not the same as progress. First, it helps to reframe how you define success. Speed and busyness are not the same as meaningful progress. In a clinic setting, quality of care, client relationships, and professional development matter more than how many items you check off in a day. A quick triage that prevented deterioration is a success even if your planned paperwork didn't get done. A calm, clear consultation that leaves a worried owner reassured is progress even if you missed a webinar. Reframing success away from a rigid milestone list helps reduce the guilt that comes with being diverted by urgent, useful work.

Structure the day around energy, not only time: veterinary work is unpredictable—emergencies, phone calls, and unexpected reactions can derail the best-laid plans. A practical way to cope is to schedule tasks based on your personal energy rhythm rather than purely on clock times. Identify when you're sharpest for demanding tasks—reading radiographs, doing complex cases, or studying new protocols—and protect those blocks. Save lower-energy tasks like routine charting, inventory checks, or quick emails for natural lulls. This approach increases the likelihood that essential work is done well and reduces frustration when interruptions occur.

Use "microgoals" to reclaim momentum: large goals can feel insurmountable when time is scarce. Break them into bite-size steps or milestones —small, specific, and achievable tasks that require short bursts of focused effort (e.g., "review three cases from last week" or "draft one paragraph for a quality-improvement plan"). Microgoals fit into the gaps between appointments and are easier to resume after interruptions. Each completed microgoal provides a psychological boost and creates tangible progress toward the bigger objective.

Adopt a flexible planning system: rigid to-do lists can amplify stress when items roll over day after day. Instead, try a flexible planning system: maintain a prioritized list, but pair it with an "adaptive daily plan." Start each day by identifying three must-do items (one clinical, one administrative/learning, one personal). If unexpected events consume your day, focus on achieving at least one. This reduces the sense of failure while keeping you moving forward. Consider a weekly review as well: a short 15–20-minute check-in to reassess priorities, celebrate wins, and reallocate unfinished items.

Create interruption-tolerant workflows: since interruptions are inevitable, create workflows that tolerate them. Use standardized templates for common notes and communications so you can finish documentation faster after a case; have checklists for procedures to reduce cognitive load; batch similar tasks (e.g., phone call follow-ups or prescriptions) to reduce context switching. These strategies minimize the cumulative time lost to switching tasks and allow you to pick up work where you left off.

Protect "deep work" with gentle boundaries: deep, focused work—learning a new surgical technique, analysing complex cases, writing a paper—requires protected time. Communicate these needs with your team and designate quiet blocks for focused tasks, while letting colleagues know how to handle urgent issues during these windows. Use signal tools (a sign on the door, a shared calendar block) to reduce avoidable interruptions. The goal is not perfect isolation but reasonable, respected boundaries that allow for meaningful progress.

Practice active acceptance and reprioritisation: when unplanned tasks arise, practice active acceptance by acknowledging that the diversion was legitimate (e.g., an emergency or an opportunity to help a colleague), then consciously reprioritise. Ask: "What can I de-scope or postpone while maintaining safety and quality?" Reprioritisation is a skill that keeps you responsive without losing sight of essential goals.

Acknowledge and celebrate real accomplishments: it's critical—both for morale and resilience—to intentionally recognise what you did accomplish. Keep a "done" list alongside your to-do list. At the end of the day or week, glance through it and note the items you completed—especially those that weren't on the original plan but were meaningful, such as calming a distressed owner, training a tech, or catching a lab anomaly. Sharing wins with your team at shift handovers or team meetings helps normalise the unpredictable nature of work and spreads appreciation.

Use simple rituals to mark progress: small rituals can reinforce recognition, such as a five-minute reflection at the end of the day, jotting down one learning point, or a quick team round of "one thing that went well today." These habits build psychological momentum and make achievements more visible.

Protect your baseline: rest, reflection, and boundaries. Sustained pace requires recovery. Prioritise sleep, regular breaks during shifts, and short mental resets (breathing exercises, a quick walk). Set realistic limits on after-hours work—turn off notifications for a dedicated personal period if possible. Reflection—weekly or monthly—helps you spot patterns: are certain types of distractions recurring? Can tasks be delegated or workflow changed? Use insights to adjust systems, not to blame yourself.

Cultivate a compassionate mindset: finally, be kind to yourself. Veterinary work is emotionally and physically demanding and being pulled in multiple directions is normal. Rather than treating missed milestones as moral failings, view them as data points that inform better planning.

Celebrate adaptability, responsiveness, and the quiet, human-centric successes that don't always appear on a checklist.

Conclusion: steady progress beats frantic speed. In a fast-paced world, the aim is sustainable progress, not perfection.

By aligning tasks with energy levels, using microgoals, protecting deep work, tolerating interruptions with flexible planning, and intentionally recognizing accomplishments, you can reduce overwhelm and keep moving forward.

You're already doing important, often unseen work—acknowledge it, pace yourself, and give space to the small wins. They add up.

Next month, we will continue looking at more ideas for improving our quality of life and overall performance both at work and at home.



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"Mother Nose Best": Case Report on an Ectopic Canine Tooth Eruption Secondary to Trauma

Drs. Michael Ferreira, Mareli van de Wetering and Prof. Gerhard Steenkamp

Patient History & Presentation

A two-year-old male Springer Spaniel was referred to the Small Animal Medicine department at the Onderstepoort Veterinary Academic Hospital (OVAH) for a nasal workup.

The primary complaint was a chronic, intermittent, unilateral mucopurulent nasal discharge of approximately eight months' duration. Prior empirical treatment with various antimicrobials and corticosteroids had provided only transient relief before clinical signs recurred.

Crucially, history-taking revealed that the patient had been bitten on the face by his dam during puppyhood. Furthermore, the owners had noted that his permanent left maxillary canine (204) had never erupted (Fig. 1).

Clinically, the patient appeared otherwise normal, and routine clinicopathological parameters (complete blood count and biochemistry) were within normal limits. As is standard protocol for nasal workups at OVAH, a CT scan of the head was performed. These scans can help with identification of foreign bodies, pathology present as well as guiding the area for biopsy.

Diagnostic Imaging

The CT scan provided a definitive, albeit highly unusual, diagnosis: the missing permanent canine tooth had erupted ectopically directly into the nasal passage (Fig 2). We hypothesized that the chronic rhinitis was secondary to localized inflammation, caused by nasal obstruction by the ectopically erupted canine tooth. The patient was then referred to the OVAH Dental Clinic for management.

Surgical Intervention

Surgical extraction was recommended to remove the foreign body from the nose and restore the normal anatomy. Following the induction of general anaesthesia and the administration of regional nerve blocks, a mucosal pedicle flap was raised (Fig 3). A buccal bone window was created using a spherical dental bur at a site corresponding to the anticipated apex of the ectopically erupted canine tooth root.

Once adequate exposure was achieved, retrograde extraction was performed via careful elevation and luxation, culminating in removal with extraction forceps (Fig 4).

The alveolar bone margins were smoothed, and the surgical site was closed without tension using a simple interrupted pattern (4-0 Monocryl).

The patient recovered uneventfully and a complete resolution of clinical signs was achieved when the owner was contacted 2 weeks post operative. The owner returned to their referring vet for the post operative examination and no concerns were noted.

Post-Extraction Findings & Discussion

Post-extraction evaluation of the tooth confirmed our hypothesis that the tooth acted as a foreign body by blocking the nasal passage. Interestingly there was calculus present on the crown (Fig 5). Notably, the crown itself was misshapen and displayed a hooked morphology. This was most probably a direct sequel of the trauma inflicted on the developing tooth bud during the bite incident.

This case highlights an intranasal presentation of ectopic tooth eruption. While impacted canine teeth are occasionally seen in brachycephalic, chondrodysplasia breeds (Lobprise 2019), they are more often managed by extracting the tooth if causing pain, cysts (like dentigerous cysts) or infection (as in this particular dog's case), facial malformation or pain (Klim, Mestrinho et al. 2023).

These teeth can also be managed via techniques such as surgical exposure, in the case of unerupted teeth. In some cases, a process similar to human orthodontics called "exposure and bracketing" is used, where an orthodontic device is bonded to the crown to actively guide eruption, however, reviewing the literature, it does not appear that this is commonly done. A retrospective study on ectopic tooth eruptions found that they mainly occur in the maxilla (69,57%) (Klim, Mestrinho et al. 2023).

This study further mentioned that ectopic tooth eruption's most likely causes can be genetic disturbances or congenital malformations, trauma, local infections, cystic lesions, retained primary teeth, tooth crowding or changes in bone density.

The most interesting part of this case is, that the ectopically erupted tooth, in effect became a nasal foreign body, causing obstruction. This case just once again goes to show, that if a tooth is absent, it does not necessarily mean that it is not there, and not causing problems.

Thorough imaging, whether it be dental radiographs and/or CT scans, are always a good idea in these cases.



Figure 1: Initial examination showed absence of left maxillary canine tooth (204)



Figure 3: To access the canine tooth's apex, a mucosal flap was raised to maxillary bone

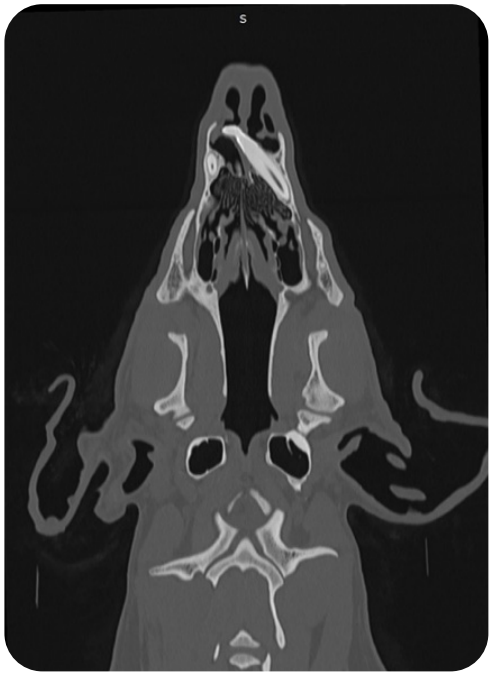


Figure 2: Dorsal plane CT image in a bone window at the level of the nasal passage, showing the ectopically erupted tooth



Figure 4: An osteotomy was cut into the maxillary bone to expose the canine tooth apex. After exposure of the canine tooth root apex the tooth was elevated and extracted through the osteotomy site



Figure 5: The extracted left maxillary canine tooth showing a developmental defect of the crown

References:

Klim, E. B., et al. (2023). "A Retrospective Study of Ectopic Eruption in 35 Dogs." Journal of Veterinary Dentistry **40**(2): 174–180.

Lobprise, H. B. (2019). "Occlusion and orthodontics." Wiggs's Veterinary Dentistry: Principles and Practice: 411–437.



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Dietary Fiber: The Clinician's Secret Weapon in Veterinary Practice

Adapted by Dr Angeliki Kaldelis (BSc, BVSc, MRCVS) from the article published by Royal Canin Academy: Royal Canin Academy - Dietary Fiber

Introduction

Dietary fiber is often overlooked in veterinary clinical practice, yet it plays a pivotal role in maintaining gastrointestinal health and overall well-being in companion animals.

This article explores the multifaceted benefits of dietary fiber, its types, mechanisms of action, and practical applications in general practice veterinary medicine.

Understanding these aspects can empower veterinarians to optimize dietary strategies for their patients, especially those with gastrointestinal, metabolic, or weight management issues.

Understanding Dietary Fiber: Beyond Bulk

Dietary fiber refers to the indigestible portion of plant-based carbohydrates that pass through the gastrointestinal tract largely intact. Traditionally, fiber was valued primarily for its role in promoting bowel regularity and stool quality. However, contemporary research reveals that fiber's benefits extend far beyond simple mechanical effects.

Fiber is broadly categorized into two types:

- **Soluble Fiber:** Dissolves in water to form a gel-like substance, fermentable by gut microbiota, producing short-chain fatty acids (SCFAs) that nourish colonocytes and modulate immune responses.
- **Insoluble Fiber:** Adds bulk to stool and accelerates intestinal transit time, aiding in the prevention of constipation.

Both types play complementary roles in maintaining gastrointestinal health and systemic well-being.

The Gut Microbiome and Fiber: A Symbiotic Relationship

One of the most significant advances in veterinary nutrition is the understanding of the gut microbiome's role in health and disease. Dietary fiber serves as a prebiotic substrate, selectively stimulating the growth of beneficial bacteria such as *Bifidobacteria* and *Lactobacilli*. These microbes ferment soluble fiber to produce SCFAs like butyrate, propionate, and acetate, which have multiple beneficial effects:

- **Energy Source:** SCFAs provide energy to colonocytes, supporting mucosal integrity.
- **Anti-inflammatory Effects:** SCFAs regulate immune responses, reducing inflammation.
- **Barrier Function:** They enhance the gut barrier, preventing pathogen translocation.
- **Systemic Benefits:** Emerging evidence links SCFAs to improved metabolic and immune health beyond the gut.

For veterinarians, leveraging fiber to modulate the microbiome offers a non-pharmacological strategy to support patients with, for example, chronic enteropathies, obesity, and diabetes.

Examples of Clinical Applications of Dietary Fiber in Veterinary Practice:

1. **Management of Gastrointestinal Disorders**

Dietary fiber supports gut motility and stool quality. Insoluble fiber increases fecal bulk and regulates transit time, which can be beneficial in managing constipation. Soluble fiber produces SCFAs through fermentation, which serve as energy sources for colonocytes, promote mucosal integrity, and have anti-inflammatory properties.

Fiber supplementation is beneficial in various GI conditions, for example:

- **Diarrhea:** Soluble fibers (such as psyllium) can absorb excess water and normalize stool consistency.
- **Constipation:** Insoluble fiber increases fecal bulk and stimulates motility.
- **Colitis and Inflammatory Bowel Disease (IBD):** SCFAs from fibre fermentation support mucosal healing and reduce inflammation.

Selecting fibre types tailored to the patient's condition is crucial.

2. **Weight Management and Obesity Control**

High-fibre diets increase satiety by slowing gastric emptying and promoting the release of satiety hormones. This can help reduce caloric intake and support weight loss or maintenance in overweight pets, a common concern in general practice.

Incorporating fibre into weight management diets also helps reduce energy density while maintaining volume, promoting satiety without excess calories. This approach supports gradual and sustainable weight loss.

3. Diabetes Mellitus Support

For diabetic patients, fibre helps regulate postprandial glucose spikes by slowing carbohydrate absorption. Soluble fibres, in particular, improve glycemic control and insulin sensitivity, by slowing glucose absorption, complementing medical management

.

Practical Considerations

- **Fibre/Diet Selection:** Veterinarians should consider the fiber source, fermentability, and the patient's tolerance when recommending diets or supplements. Diets should be selected with appropriate fiber types and levels based on the patient's clinical condition. Many veterinary therapeutic diets are formulated with specific fiber blends.
- **Balanced Diet:** Fiber should complement a balanced diet, ensuring all nutritional requirements are met.
- **Gradual Introduction:** Sudden increases in dietary fiber can potentially cause gas and discomfort. Introduce fiber gradually to allow adaptation.
- **Monitoring:** Regularly assess stool quality, body condition, and clinical signs to adjust fiber intake.
- **Client Education:** Educate pet owners on the importance of fiber and adherence to dietary recommendations.

Conclusion

Dietary fiber is a versatile and powerful tool in the veterinary clinician's arsenal. Its benefits extend beyond simple stool regulation to influencing gut microbiota, metabolic health, and disease management. By understanding the types of fiber and their physiological effects, general practice veterinarians can tailor dietary interventions to improve patient outcomes effectively.

For a comprehensive understanding, detailed guidance, and references please visit the Royal Canin Academy for the full article 'Dietary Fiber: The Clinician's Secret Weapon', Written by Adam J. Rudinsky (Jul 5 2023)

https://academy.royalcanin.com/en/veterinary/dietary-fiber-the-clinicians-secret-weapon

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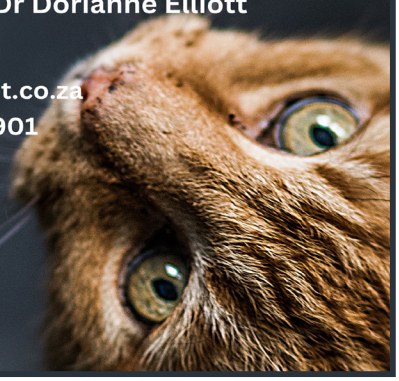
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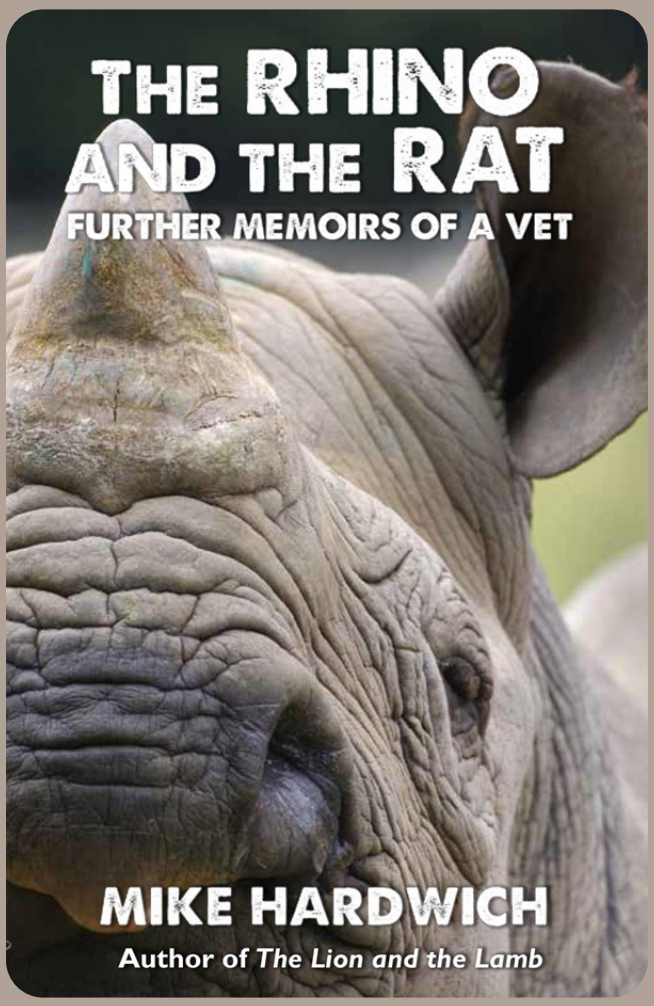
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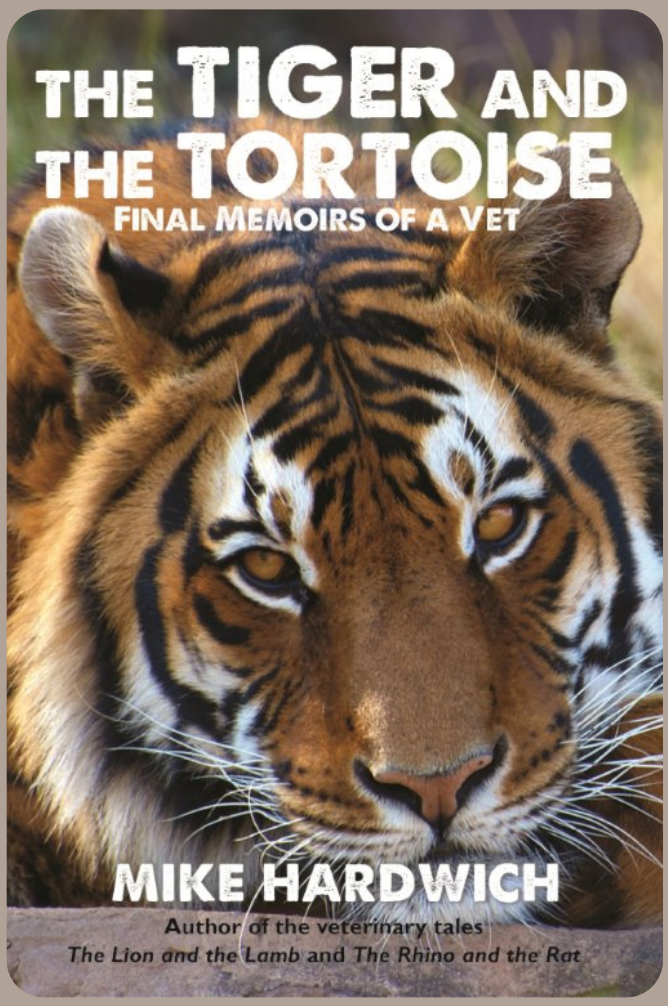
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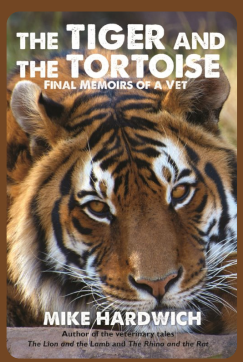




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