

# A Cybernetic Reappraisal of Disease in Mammalian Carnivores

*A Manifesto for Reform in Veterinary and Medical Thought*

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## Status of this Document

**Working Manifesto (Version 1.0, April 2026)**

This document sets out a conceptual framework intended to stimulate discussion, critical evaluation, and further research. It is not presented as a formal academic publication but as a position paper outlining a testable hypothesis.

The ideas expressed here may form the basis of future peer-reviewed work.

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## 1. Introduction

Over several decades, substantial evidence has accumulated indicating widespread chronic disease in domestic animals, particularly mammalian carnivores. These conditions—most notably periodontal disease—persist despite adherence to prevailing veterinary advice, regulatory oversight, and commercially established nutritional practices.

The persistence of these conditions raises a fundamental question:

**Are current failures primarily due to misuse of an otherwise sound system, or do they reflect limitations in the underlying scientific framework itself?**

This document advances the latter proposition.

It argues that prevailing models of disease—largely grounded in linear, reductionist thinking—are insufficient to account for the observed patterns of chronic disease. In their place, it proposes a cybernetic, evolutionary, and ecological framework better suited to understanding health and disease in mammalian carnivores.

While developed within the veterinary domain, the argument has broader biological relevance. Carnivores, occupying the extreme end of the nutritional spectrum, provide a particularly clear model system through which fundamental biological processes may be observed.

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## 2. The Limits of the Prevailing Model

Contemporary veterinary and medical practice is heavily informed by:

- Linear cause–effect reasoning
- Reductionist analysis of isolated variables
- Short time-horizon experimental designs
- Increasing reliance on “evidence-based” hierarchies derived from controlled trials

While these approaches have yielded important insights, they exhibit clear limitations when applied to chronic, multifactorial disease.

In particular:

- They struggle to explain the **near-ubiquity** of periodontal disease in domestic carnivores
- They emphasise proximate mechanisms (e.g. plaque, bacteria) while neglecting system-level conditions
- They rely on comparisons between “healthy” and clinically manifest disease, often overlooking prolonged subclinical states

A central limitation lies in the assumption of discrete causation. In complex biological systems, it may be more appropriate to speak of **initiating conditions, triggers, and system states** rather than singular causes.

The result is a framework that, while effective in describing components of disease, remains incomplete in explaining its persistence and distribution.

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## 3. A Cybernetic Perspective

Cybernetics concerns systems characterised by feedback, regulation, and dynamic equilibrium.

Applied to biological organisms, this perspective emphasises:

- Continuous organism–environment interaction
- Feedback loops linking behaviour, physiology, and microbiology
- Sensitivity to prevailing conditions
- Maintenance—and failure—of system stability

Within this framework, disease is understood not as the product of isolated causes, but as the emergence of instability within regulatory systems.

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## 4. Evolutionary Context and Biological Design

Mammalian carnivores evolved under conditions that included:

- Consumption of whole prey
- Mechanical processing of food (chewing, tearing)
- Cyclical feeding patterns
- Co-evolved relationships with microbial communities

Modern feeding practices diverge markedly from these conditions.

This divergence is not merely nutritional, but functional—affecting systems evolved for interaction with specific environmental inputs.

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## 5. Developmental “Pinch Points”

Two critical developmental phases highlight system sensitivity:

- Eruption of deciduous teeth (approximately 2–6 weeks)
- Eruption of permanent dentition (approximately 4–6 months)

These periods involve:

- Gingival disruption
- Microbial exposure
- Behavioural adaptation

Under natural conditions, these phases are accompanied by appropriate mechanical and environmental inputs.

In their absence, transient physiological states may become stabilised as persistent dysfunction.

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## 6. Periodontal Disease Reconsidered

Periodontal disease is widely prevalent in domestic carnivores.

Conventional models typically associate it with:

- Plaque accumulation
- Bacterial colonisation
- Local inflammatory responses

While these factors are involved, they may represent proximate expressions of deeper systemic imbalance.

From a cybernetic perspective, periodontal disease may be understood as:

**A failure of regulatory systems linking diet, oral mechanics, microbial ecology, and host response.**

Importantly:

- Clinically visible disease may represent the endpoint of a prolonged subclinical process
- The distinction between subclinical and clinical disease may be **a matter of degree rather than kind**

This challenges conventional interpretations of disease onset and progression.

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## **7. Systemic Implications**

There is increasing recognition of associations between oral health and systemic disease.

Within a cybernetic framework:

- Local pathology may reflect system-wide dysregulation
- Chronic low-grade dysfunction may precede overt disease
- Persistent subclinical disturbance may exert cumulative systemic effects

This perspective aligns with emerging work on host–microbiome interactions and systemic inflammation.

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## **8. Diet, Behaviour, and System Regulation**

Within this framework, diet functions not only as a source of nutrients, but as a regulator of biological systems.

Key considerations include:

- Physical structure of food
- Mechanical interaction with tissues
- Behavioural engagement
- Effects on microbial ecosystems

Deviation from evolutionary norms may disrupt these regulatory processes.

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## **9. Evidence, Prediction, and Testing**

The cybernetic hypothesis is not presented as established fact, but as a framework for investigation.

It generates testable propositions, including:

- That dietary structure and oral mechanics influence microbial ecology
- That developmental “pinch points” may affect long-term disease trajectories
- That subclinical dysfunction precedes overt disease
- That systemic health may be associated with restoration of regulatory balance

These propositions invite investigation using both conventional and systems-based approaches.

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## **10. Implications for Science in the Computational Age**

Prevailing biomedical paradigms were largely developed prior to the advent of modern computational tools.

Cybernetic and systems-based approaches are inherently suited to:

- Modelling complex interactions
- Analysing feedback systems
- Integrating multi-variable data

The current era provides tools capable of addressing biological complexity more appropriately than earlier frameworks allowed.

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## **11. Institutional Implications**

If the prevailing framework is incomplete, then:

- Regulatory systems based upon it may also be limited
- Educational curricula may require reassessment
- Research priorities may benefit from expansion

This is not an argument against science, but for a broader conception of science capable of addressing complex, interacting systems.

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## **12. A Call for Reappraisal**

The issues described are often framed as matters of:

- Industry influence
- Regulatory failure
- Professional conduct

While such factors may play a role, they do not fully account for the persistence of the problem.

A more fundamental reappraisal is required—one that examines the conceptual foundations of current practice.

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## 13. Conclusion

The continued prevalence of chronic disease in domestic carnivores suggests that existing models are incomplete.

A cybernetic, evolutionary framework offers:

- Greater explanatory coherence
- Integration across domains
- A basis for new lines of inquiry

The appropriate response is not dismissal, but engagement.

**The question is not whether the current model can be defended, but whether it is sufficient.**

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## Recent developments (2026)

Emerging analyses within periodontal research continue to highlight the limitations of linear causal inference in the presence of interacting biological and environmental factors. Recent contributions in the *Journal of Periodontal Research* emphasise uncertainty, bidirectionality, and systemic complexity—features long predicted by the cybernetic hypothesis. These converging lines of evidence suggest that a shift towards a systems-based, cybernetic framework is not speculative, but increasingly necessary for coherent interpretation of the data.

## Closing Note

This document is offered in the spirit of inquiry, with the expectation that its value will be determined through critical scrutiny and empirical testing.