Veterinary and Zootechnics as Cultural Governance: A Toulminian Argument for Designing Modes of Life

Tzitzi de la Colina García[1], Federico de la Colina Flores[2], Heriberto Rodríguez Frausto[3*], Paul Alexis de la Colina García[4]

[1]Colegio Edison A.C. Guadalupe, Zac. México. https://orcid.org/0000-0001-8502-3903
[2]Universidad Autónoma de Zacatecas. México. https://orcid.org/0000-0002-8890-2863
[3]Universidad Autónoma de Zacatecas. México. https://orcid.org/0000-0001-9608-5843
[4]Colegio Edison A.C. Guadalupe, Zac. México. https://orcid.org/0009-0000-1666-1469

Abstract

This article advances four linked claims about culture, modes of life, and the professional responsibility of the *médico veterinario zootecnista* (MVZ, Spanish to name the veterinarian and zootechnist). Using Toulmin's argumentation pattern, it argues (1) that both human and animal cultures develop historically in relation to their respective modes of life; (2) that the MVZ functions as a designer and administrator of modes of life for companion animals and their owners, productive domestic animals, and managed wildlife; (3) that this positions the profession as a consequential actor in global cultural development; and (4) that this responsibility should be exercised through a welfare-centered stance that is democratic and community-oriented, aligned with One Health/One Welfare and with participatory practices. The resulting framework reframes veterinary zootechnics as *cultural governance*: the ethically guided design of socio-material conditions that shape learned practices, welfare outcomes, and public goods.

Keywords: animal culture; cultural evolution; domestication; One Health; One Welfare; veterinary governance; participatory epidemiology; Toulmin model

From Human–Animal Cultural Evolution to Democratic, Community-Oriented Welfare Practice

1. Introduction

Veterinary and zootechnics (or animal husbandry) are commonly described through technical functions clinical decision-making, herd health, production efficiency, biosecurity, and food safety. Yet these functions are also *cultural* in a strong sense: they stabilize, modify, and sometimes reinvent learned practices distributed across humans, animals, institutions, and environments. The profession participates in shaping how humans live with animals, how animals live among humans, and how these relations scale into agriculture, conservation, and public health systems.

*Corresponding Author Email: mvzhrf1958@hotmail.com
Published: 28 January 2026
DOI: https://doi.org/10.70558/IJST.2026.v3.i1.241173

Two developments make this cultural dimension difficult to ignore. First, research in animal behavior and evolutionary biology increasingly documents socially learned traditions "animal cultures" across diverse taxa, making culture a comparative phenomenon rather than an exclusively human one (Laland, 2008; Schuppli & Schaik, 2019; Whiten et al., 1999; Whiten, 2021). Second, global governance frameworks now treat animal health, animal welfare, and veterinary services as matters of public goods and collective security, particularly at the human–animal–environment interface (Food and Agriculture Organization of the United Nations (FAO), n.d.; World Health Organization et al., 2021, 2022; World Organization for Animal Health (WOAH), 2013). These shifts invite a philosophical and professional re-description: the MVZ is not only a technical expert but also a co-producer of cultural trajectories in multispecies societies.

The central question, then, is not merely whether veterinary practice affects culture it obviously does but *how to justify* this claim rigorously and what responsibilities follow from it. Toulmin's model of practical argumentation provides a disciplined structure for making such justifications explicit and contestable (Toulmin, 1958). This article uses that structure to build four connected arguments and to extract their implications for welfare-centered, democratic, community-oriented professional conduct.

2. Conceptual Orientation: Culture and "mode of Life" in Human and Animal Systems

2.1 Culture as Socially Learned and Historically Transmitted Practice

In comparative perspective, "culture" is often operationalized as behavioral or informational variation that is (i) acquired through social learning and (ii) shared within a group, (iii) persisting over time as traditions or repertoires (Laland, 2008; Schuppli & Schaik, 2019; Whiten, 2021). Iconic evidence includes population-level differences in chimpanzee tool-use and social practices that cannot be parsimoniously reduced to immediate ecological or genetic differences (Whiten et al., 1999). Importantly, contemporary scholarship does not claim that animal cultures are identical to human cultures; rather, it treats culture as a family of phenomena with different degrees of cumulative complexity and institutional embedding (Brakes et al., 2025; Whiten, 2021).

2.2 "Mode of Life" as a Structured Niche: Socio-ecological Conditions Plus Patterned Activity

"Mode of life" is used here as a synthetic term: the relatively stable organization of (a) material conditions (resources, built environments, technologies), (b) social structures (grouping, cooperation, authority, roles), and (c) recurring practical problems (foraging, reproduction, safety, caregiving, production) that orient learning and behavior. In evolutionary terms, such organization is closely related to the niche that organisms inhabit and, crucially, the niche they *construct* the environmental modifications and inherited conditions produced by prior activity (Kendal et al., 2011; Purugganan, 2022; Zeder, 2017). In human societies, niche construction scales through institutions and material culture; in animal societies, it scales through social learning, habitat use, and group-level practices sometimes becoming directly relevant to conservation and management (Brakes et al., 2025; Kendal et al., 2011). Our extended concept of mode of life has been published elsewhere (de la Colina Flores et al., 2025).

This framing makes the core thesis plausible: culture is not a free-floating set of symbols; it is adaptive, historical, and entangled with the problems and affordances of a mode of life.

3. Method: Toulmin's Argumentation Pattern as a Design Tool for Professional Justification

Toulmin's model distinguishes components of practical arguments: Claim (what is asserted), Grounds/Data (supporting evidence), Warrant (the rule/bridge that licenses moving from data to claim), Backing (support for the warrant), Qualifier (strength/conditions), and Rebuttal (recognized exceptions) (Toulmin, 1958). In professional education, this structure is especially useful because it forces implicit assumptions (warrants) into the open precisely where ethical and political disagreements often reside.

The next sections present four Toulmin-structured arguments, then synthesize their educational and professional implications.

4. Toulmin-structured Arguments

4.1 Argument 1: Human and Animal Cultures Develop Historically in Accordance with Their Modes of Life

Claim (C1). Human and animal cultures develop historically in accordance with their respective modes of life.

Grounds/Data (D1).

1. Animal groups exhibit socially learned traditions that differ across populations and persist over time, including in chimpanzees and other taxa (Laland, 2008; Schuppli & Schaik, 2019; Whiten et al., 1999; Whiten, 2021).
2. Human cultural evolution is deeply coupled to niche construction: humans modify environments, transmit learned practices, and thereby alter selection pressures and developmental contexts for themselves and other species (Kendal et al., 2011).
3. Domestication exemplifies historical coevolution between "domesticator" and "domesticate," embedding animals in human-managed niches that reshape behavior, biology, and practices across generations (Purugganan, 2022; Zeder, 2017).
4. Conservation research increasingly treats animal culture as ecologically consequential, affecting survival and requiring management attention under environmental change (Brakes et al., 2025).

Warrant (W1). If culture is socially learned information and practice that helps organisms solve recurrent problems, then cultural repertoires will be shaped by (and will track changes in) the socio-ecological conditions and activity demands that define a mode of life.

Backing (B1). Comparative reviews explicitly define animal culture via social learning and show how socio-ecological constraints structure what can be learned, retained, and transmitted (Laland, 2008; Schuppli & Schaik, 2019; Whiten, 2021). Niche construction theory explains how inherited modified environments ("ecological inheritance") stabilize and channel learning

and adaptation, especially in humans (Kendal et al., 2011). Domestication scholarship argues that long-run human–animal mutualisms restructure niches and thereby reorganize developmental and behavioral pathways (Purugganan, 2022; Zeder, 2017).

Qualifier (Q1). This claim holds *probabilistically and historically*: cultural development is strongly conditioned by modes of life, but not exhaustively determined by them.

Rebuttals/Exceptions (R1).

- Some population differences are driven by ecology or genetics rather than culture; robust inference requires careful controls and converging methods (Schuppli & Schaik, 2019; Whiten, 2021).
- Cultural transmission can introduce path dependence and "drift," so not every tradition is optimal for current conditions (Brakes et al., 2025).
- Human cumulative culture is distinctive in its institutional scaling, but this is a difference in degree/architecture, not a reason to exclude animals from cultural analysis (Whiten, 2021).

Interim implication. Culture human or animal should be treated as a historical layer of adaptation and coordination embedded in patterned life conditions. Therefore, any profession that redesigns those conditions participates in cultural development.

4.2 Argument 2: the Veterinary Zootechnician as Designer and Administrator of Modes of Life

Claim (C2). The MVZ is a designer and administrator of modes of life for companion animals and their owners, productive domestic animals, and managed wildlife.

Grounds/Data (D2).

1. Veterinary professionals contribute to animal and human health, welfare, food quality and safety, food security, and environmental and biodiversity concerns roles that extend beyond individual treatment to system-level management (Cáceres, 2012).
2. Veterinary governance frameworks position veterinary services as essential to public goods such as food security, public health, food safety, and poverty alleviation; they emphasize surveillance, legislation, and coordinated capacity as societal infrastructure (Food and Agriculture Organization of the United Nations (FAO), n.d.; World Organization for Animal Health (WOAH), 2013).
3. In companion animal practice, veterinarian–client communication and shared decision-making are recognized as core competencies shaping care choices, compliance, and welfare outcomes i.e., shaping household-level human–animal life arrangements (Cornell & Kopcha, 2007; McDermott et al., 2015).
4. Participatory and community-based approaches in animal health surveillance demonstrate that veterinary work often reorganizes local practices, knowledge flows,

and institutional linkages, not merely clinical interventions (Catley et al., 2012; Jost et al., 2007).

Warrant (W2). To design or administer a mode of life is to intentionally configure the socio-material conditions and rule-like arrangements that structure daily activity and learning (housing, feeding, reproduction, movement, enrichment, disease control, biosecurity, and human caregiving practices). Veterinary zootechnics routinely performs this configuration across household, farm, zoo, and conservation contexts.

Backing (B2). The profession's documented scope includes system design (production systems, herd health planning, preventive programs), governance (standards, surveillance), and relational work (client-centered dialogue) (Cáceres, 2012; Cornell & Kopcha, 2007; World Organization for Animal Health (WOAH), 2013). One Health frameworks formalize the interdependence of animal health, human health, and environmental conditions, reinforcing the view that veterinary action is structurally ecological and social rather than merely individual and biomedical (World Health Organization et al., 2021, 2022).

Qualifier (Q2). The MVZ is *often* a co-designer rather than a unilateral designer: households, producers, regulators, and communities share agency, constraints, and authority.

Rebuttals/Exceptions (R2).

- Market forces and client preferences can dominate life-design decisions, limiting veterinary influence; hence the centrality of communication and negotiation (McDermott et al., 2015).
- In some settings, veterinary services are under-resourced; governance and community partnership become preconditions for meaningful mode-of-life administration (World Organization for Animal Health (WOAH), 2013).
- Wildlife and conservation contexts impose ethical constraints: "design" must be oriented toward welfare and ecological integrity, not convenience or spectacle.

Interim implication. If culture develops with modes of life (C1), and the MVZ co-designs modes of life (C2), then the MVZ participates in cultural development as a practical matter, whether acknowledged or not.

4.3 Argument 3: Professional Responsibility in Global Cultural Development

Claim (C3). Because the MVZ co-designs multispecies modes of life at scale, the profession bears significant responsibility in global cultural development.

Grounds/Data (D3).

1. Veterinary systems contribute to global public goods and collective security (food safety, zoonotic risk management, surveillance capacity), so their effects scale beyond local clients (Food and Agriculture Organization of the United Nations (FAO), n.d.; World Organization for Animal Health (WOAH), 2013).

2. One Health is explicitly framed as an integrative approach spanning human, animal, and ecosystem health, implying that professional practice shapes societal norms and coordinated action across sectors (World Health Organization et al., 2021, 2022).
3. Animal health and welfare are increasingly debated as public goods, involving societal prioritization and shared responsibility, not only private preference (Clark et al., 2024).
4. The cultural dimension of animals matters for management and conservation under change; this expands the ethical domain of intervention to include preservation of socially learned capacities and traditions in animal populations (Brakes et al., 2025).

Warrant (W3). When a profession systematically shapes the conditions under which humans and animals learn, reproduce, cooperate, and suffer or flourish and does so across institutionalized systems its actions enter the domain of cultural development (the long-run stabilization and transformation of learned practices, norms, and shared life arrangements).

Backing (B3). Niche construction theory supports the idea that environmental and institutional modifications are inherited conditions that channel future behavior and learning (Kendal et al., 2011). Veterinary governance texts explicitly treat veterinary services as societal infrastructure whose failures can place broader communities at risk (World Organization for Animal Health (WOAH), 2013). The One Health and One Welfare lines of work explicitly integrate welfare, sustainability, and cross-sector coordination, reinforcing the claim that veterinary action is part of societal self-organization (García Pinillos et al., 2016; García et al., 2017; World Health Organization et al., 2022).

Qualifier (Q3). This responsibility is *distributed* (not exclusive) and must be interpreted relative to actual authority, resources, and institutional mandates.

Rebuttals/Exceptions (R3).

- It may be argued that "culture" is too expansive a term for professional responsibility. The counterpoint is that the relevant sense of culture here is operational and comparative: socially learned practice embedded in modes of life (Sections 2.1–2.2), not merely symbolic expression (Laland, 2008; Schuppli & Schaik, 2019).
- Some may argue that global outcomes are too indirect to assign responsibility. Governance literature on public goods treats indirectness as precisely why collective standards and democratic legitimacy are needed (Clark et al., 2024; World Organization for Animal Health (WOAH), 2013).

Interim implication. The profession's ethical horizon extends beyond "competent service delivery" to stewardship of multispecies life arrangements whose cultural consequences accumulate across generations.

4.4 Argument 4: Welfare-centered, Democratic, Community-oriented Professional Practice

Claim (C4). The MVZ's role in cultural development should be grounded in human and animal welfare and exercised through a democratic position and community orientation.

Grounds/Data (D4).

1. One Welfare explicitly links animal welfare, human wellbeing, biodiversity, and environmental conditions, positioning welfare as an integrative societal goal rather than a narrow technical variable (García Pinillos et al., 2016; García et al., 2017).
2. One Health governance (including the joint plan of action) emphasizes coordinated, cross-sector action at the human–animal–environment interface, which in practice requires stakeholder participation and legitimacy (World Health Organization et al., 2021, 2022).
3. Veterinary governance documents describe standards adopted through international (and therefore politically mediated) processes; they also emphasize transparency, universal availability, and public-good functions features aligned with democratic accountability (World Organization for Animal Health (WOAH), 2013).
4. Participatory epidemiology and community-based animal health programs demonstrate that community knowledge, participation, and co-production can strengthen surveillance and intervention, particularly in resource-limited settings (Catley et al., 2012; Jost et al., 2007).
5. In companion animal contexts, shared decision-making and client-centered communication are established as best practice, embedding respect, transparency, and negotiated responsibility in care (Cornell & Kopcha, 2007; McDermott et al., 2015).

Warrant (W4). If veterinary zootechnics reshapes modes of life that affect welfare and public goods, then ethical legitimacy requires (i) explicit welfare commitments and (ii) decision processes that are participatory, transparent, and responsive to affected communities especially when interventions distribute risks and benefits across stakeholders.

Backing (B4). One Welfare provides an explicit normative platform for integrating welfare across species and environments (García Pinillos et al., 2016; García et al., 2017). Good veterinary governance defines veterinary services as universally available, transparently provided, and tied to public goods, implying accountability beyond private contracting (World Organization for Animal Health (WOAH), 2013). Empirical and methodological work in participatory epidemiology supports community engagement as both epistemically productive (better information) and pragmatically effective (better uptake and sustainability) (Catley et al., 2012; Jost et al., 2007).

Qualifier (Q4). "Democratic" here is practical and layered: from micro-level shared decisions (clinic, farm) to meso-level participatory programs (community surveillance) to macro-level accountability via standards and public institutions.

Rebuttals/Exceptions (R4).

- Emergencies may require rapid action with limited deliberation; nevertheless, transparency and post-hoc accountability remain obligations consistent with governance standards (World Organization for Animal Health (WOAH), 2013).

- Communities can hold conflicting values (e.g., economic survival vs. welfare demands). A welfare-centered democratic stance does not remove conflict; it structures how conflicts are negotiated and whose voices count, including attention to animals as welfare subjects (Clark et al., 2024; García Pinillos et al., 2016).

Synthesis. C1–C3 establish that veterinary zootechnics functions as cultural governance through mode-of-life design. C4 specifies the normative constraint: this governance is justified only when oriented toward welfare and carried out with democratic, community-engaged methods.

5. Consolidated Toulmin Map

Argument-aligned claim	Grounds (illustrative)	Warrant (bridge)	Qualifiers & rebuttals
C1 Culture tracks modes of life	Animal cultures; niche construction; domestication coevolution (Kendal et al., 2011; Purugganan, 2022; Whiten et al., 1999)	Culture solves recurrent problems under socio-ecological constraints	Not all variation is cultural; cumulative culture differs by degree (Schuppli & Schaik, 2019; Whiten, 2021)
C2 MVZ designs/administers modes of life	System-level roles; governance; communication practice (Cáceres, 2012; Cornell & Kopcha, 2007; World Organization for Animal Health (WOAH), 2013)	Configuring conditions of daily activity = mode-of-life design	Often co-design; constrained by markets/institutions
C3 MVZ responsible in global cultural development	Public goods; One Health; animal culture in conservation (Brakes et al., 2025; Clark et al., 2024; World Health Organization et al., 2021)	Scaling effects on learned practice ⇒ cultural responsibility	Responsibility distributed; varies by mandate/capacity
C4 Must be welfare-centered, democratic, community-oriented	One Welfare; participatory epi; shared decision-making (García Pinillos et al., 2016; Jost et al., 2007; McDermott et al., 2015)	Legitimacy requires welfare commitments + participatory accountability	Emergency exceptions; value conflicts require negotiated settlements

6. Implications for Veterinary Zootechnician Formation and Professional Ethics

Practical Implications

1. **Treat "mode-of-life design" as a core professional object.** Planning housing, feeding, enrichment, reproduction, movement, biosecurity, and human caregiving practices should be taught and assessed explicitly as *design for welfare and sustainability* rather than as ad hoc "recommendations."
2. **Add "cultural impact assessment" to routine reasoning.** When proposing interventions, ask: what practices will this stabilize over months and years (in clients, staff, animals), and what traditions might it disrupt (in managed wildlife or animal communities)?
3. **Institutionalize democratic micro-practices.** Client-centered dialogue and shared decision-making are not soft skills; they are mechanisms of legitimate governance in plural-value contexts (Cornell & Kopcha, 2007; McDermott et al., 2015).
4. **Build community epistemology.** Participatory epidemiology methods should be taught as knowledge-producing tools that can strengthen surveillance, trust, and uptake, especially in rural and peri-urban contexts (Catley et al., 2012; Jost et al., 2007).

A further implication is professional self-understanding: the MVZ can be described as a steward of multispecies welfare within socio-technical systems whose outputs are not only products (milk, meat, services, conservation outcomes) but also *patterns of life* habits, norms, and learned practices distributed across humans and animals. This description is consistent with governance frameworks that treat veterinary services as part of societal infrastructure for public goods (World organization for Animal Health (WOAH), 2013) and with welfare frameworks that integrate human wellbeing, animal welfare, and environmental conditions (García Pinillos et al., 2016).

7. Conclusion

Using Toulmin's argumentation pattern, this article justified four connected claims: (1) human and animal cultures develop historically with modes of life; (2) the MVZ co-designs and administers modes of life across households, farms, and managed wildlife contexts; (3) therefore the profession bears responsibility in global cultural development; and (4) this responsibility should be grounded in welfare and carried out through democratic, community-oriented practice. The overarching conclusion is that veterinary zootechnics is a form of cultural governance one that must remain accountable to welfare outcomes and to participatory legitimacy.

References

Brakes, P., Aplin, L., Carroll, E. L., Greggor, A. L., Whiten, A., & Garland, E. C. (2025). Animal culture: Conservation in a changing world. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *380*(1925), 20240127. https://doi.org/10.1098/rstb.2024.0127

Cáceres, S. B. (2012). The roles of veterinarians in meeting the challenges of health and welfare of livestock and global food security. *Veterinary Research Forum*, *3*(3), 155–157.

Catley, A., Alders, R. G., & Wood, J. L. N. (2012). Participatory epidemiology: Approaches, methods, experiences. *The Veterinary Journal*, *191*(2), 151–160. https://doi.org/10.1016/j.tvjl.2011.03.010

Clark, B., Boaitey, A., & Hubbard, C. (2024). Animal health and welfare as a public good: What do the public think? *Agriculture and Human Values*. https://doi.org/10.1007/s10460-024-10585-0

Cornell, K. K., & Kopcha, M. (2007). Client-veterinarian communication: Skills for client centered dialogue and shared decision making. *Veterinary Clinics of North America: Small Animal Practice*, *37*(1), 37–47. https://doi.org/10.1016/j.cvsm.2006.10.005

de la Colina Flores, F., Rodríguez Frausto, H., De La Colina García, T. T., & de la Colina García, P. A. (2025). The concept of mode of life in veterinary education in Mexico. *International Journal of Science and Technology (IJST)*, *2*(4), 13–38. https://doi.org/10.70558/IJST.2025.v2.i4.241097

Food and Agriculture Organization of the United Nations (FAO). (n.d.). *Veterinary public health*. Web page. https://www.fao.org/animal-health/areas-of-work/veterinary-public-health/en

García Pinillos, R., Appleby, M. C., Manteca, X., Scott-Park, F., Smith, C., & Velarde, A. (2016). One welfare a platform for improving human and animal welfare. *Veterinary Record*, *179*(16), 412–413. https://doi.org/10.1136/vr.i5470

García, R. et al. (2017). *"One welfare": A framework to support the implementation of OIE animal welfare standards*. OIE Bulletin (special dossier: animal welfare). https://www.woah.org/app/uploads/2021/03/bull-2017-1-eng.pdf

Jost, C. C., Mariner, J. C., Roeder, P. L., Sawitri, E., & Macgregor-Skinner, G. J. (2007). Participatory epidemiology in disease surveillance and research. *Revue Scientifique Et Technique (Office International Des Epizooties)*, *26*(3), 537–549.

Kendal, J., Tehrani, J. J., & Odling-Smee, J. (2011). Human niche construction in interdisciplinary focus. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *366*(1566), 785–792. https://doi.org/10.1098/rstb.2010.0306

Laland, K. N. (2008). Animal cultures. *Current Biology*, *18*(9), R366–R370. https://doi.org/10.1016/j.cub.2008.02.049

McDermott, M. P., Tischler, V. A., Cobb, M. A., Robbe, I. J., & Dean, R. S. (2015). Veterinarian–client communication skills: Current state, relevance, and opportunities for improvement. *Journal of Veterinary Medical Education*. https://doi.org/10.3138/jvme.0115-006R

Purugganan, M. D. (2022). What is domestication? *Trends in Ecology & Evolution*, *37*(8), 663–671. https://doi.org/10.1016/j.tree.2022.04.006

Schuppli, C., & Schaik, C. P. van. (2019). Animal cultures: How we've only seen the tip of the iceberg. *Evolutionary Human Sciences*, *1*, e2. https://doi.org/10.1017/ehs.2019.1

Toulmin, S. E. (1958). *The uses of argument*. Cambridge University Press.

Whiten, A. (2021). The burgeoning reach of animal culture. *Science*, *372*(6537), eabe6514. https://doi.org/10.1126/science.abe6514

Whiten, A., Goodall, J., McGrew, W. C., Nishida, T., Reynolds, V., Sugiyama, Y., Tutin, C. E. G., Wrangham, R. W., & Boesch, C. (1999). Cultures in chimpanzees. *Nature*, *399*(6737), 682–685. https://doi.org/10.1038/21415

World Health Organization, Food and Agriculture Organization of the United Nations, World Organization for Animal Health, & United Nations Environment Programme. (2021). *Tripartite and UNEP support OHHLEP's definition of one health*. WHO News Release (01 December 2021). https://www.who.int/news/item/01-12-2021-tripartite-and-unep-support-ohhlep-s-definition-of-one-health

World Health Organization, Food and Agriculture Organization of the United Nations, World Organization for Animal Health, & United Nations Environment Programme. (2022). *One health joint plan of action (2022–2026)*. Quadripartite publication. https://www.who.int/publications/i/item/9789240059139

World Organization for Animal Health (WOAH). (2013). *Good veterinary governance*. OIE/WOAH publication (PDF). https://www.woah.org/app/uploads/2021/03/gouv-en.pdf

Zeder, M. A. (2017). Domestication as a model system for the extended evolutionary synthesis. *Interface Focus*, *7*(5), 20160133. https://doi.org/10.1098/rsfs.2016.0133