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Interspecies Sustainability to Ensure Animal Protection: Lessons from the Thoroughbred Racing Industry

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Abstract: There is a disconnect between dominant conceptions of sustainability and the protection of animals arising from the anthropocentric orientation of most conceptualisations of sustainability, including sustainable development. Critiques of this disconnect are primarily based in the context of industrial animal agriculture and a general model of a species-inclusive conception of sustainability has yet to emerge. The original contribution of this article is two-fold: First, it develops a theoretical framework for interspecies sustainability. Second, it applies this to a case study of the thoroughbred racing industry. Interviews were conducted with thoroughbred industry and animal advocacy informants in the US, Australia and Great Britain. While industry informants claim thoroughbred welfare is seminal for industry sustainability, they adopt a market-oriented anthropocentric conception of sustainability and do not consider animal welfare a sustainability domain in its own right. Animal advocacy informants demonstrate a deeper understanding of welfare but some express discomfort about linking sustainability, welfare and racing. Eight analytical layers have been identified in the discourse in the interface of sustainability and animal protection, of which two have transformational potential to advance interspecies sustainability. Interspecies sustainability urgently needs to be advanced to ensure animal protection in the sustainability transition, and to not leave the defining of animal welfare and sustainability to animal industries.

Keywords: sustainability; interspecies sustainability; animal welfare; animal agency; anthropocentrism; interspecies justice; relationality; ecocentrism; naturalness; animal advocacy

1. Introduction

It is well-established that mainstream conceptions of sustainability and their manifestations in theory and practice are anthropocentric in focus. Anthropocentric sustainability orientations not only marginalise and ignore the interests of nature and animal lives, they treat nature and animals as resources for human use and determine their value by the benefit they provide for humans [1]. Sustainable development is singled out by Andrew Dobson as a particular theory of anthropocentric (environmental) sustainability. There are market-based approaches and equity-based approaches, but in each case, human interest in human welfare is the principal motivation ([1], p. 423). The concept of sustainable development was popularised by the Brundtland report published in 1987 and globally enthroned with the Earth Summit in Rio de Janeiro in 1992 ([2], p. 352). Rio signifies an "unholy alliance between development enthusiasts in the South and growth fatalists in the North" ([3], p. 432). The WCED sees growth as the solution to alleviate poverty "rather than tackle the thorny problem of redistribution" ([4], p. 32). The role of corporate interests that dominate the discourse shaping the sustainable development agenda was calculated and orchestrated. CJ Silas, chairman and CEO of Phillips Petroleum Company wrote in 1990: "There's no reason we can't make the environmental issue our issue" ([5], p. 34). In the same vein, agribusiness has seized the opportunity and legitimises

the exploitation of animals with the sustainable development agenda, facilitated by government and intergovernmental agencies [6].

1.1. Animals as Resource Repositories and Production Systems

The Brundtland report engraves the use of animals as natural resources. It references animals in three forms—as wildlife implicitly being a constituent of ecosystems and biodiversity, as pest to be controlled, and as "livestock", i.e., living stock. Explicitly, wildlife is referred to in one instance as "creatures of beauty" ([7], p. 35), but predominantly, wildlife is called a "living natural resource", a carrier of "genetic variability and germplasm material" who makes "contributions to agriculture, medicine, and industry worth many billions of dollars per year", and a provider for "new raw materials for industry". Fish are given special mention as providers of animal protein. In other words, the value of wildlife is predominantly residing in the economic opportunities it provides for human social and economic systems. Farm animals are referred to as livestock responsible for the overuse of natural resources, clearing of tropical forests and the destruction of the lucrative "wild pool of genes". Rather than recommending shrinking the livestock sector, the report recommends the intensification of production practices, at the expense of animal welfare and social, human and environmental health [8–10].

Over the past two decades, the critique of the sustainable development agenda and its manifestations in the practices of industrial animal agriculture has been increasing. Industrial animal agriculture is recognised as one of the main causes of exceeding planetary boundaries [11], of species extinction and climate collapse [12], and increasing human and nonhuman injustices ([6,13] [14] (p. 5) [15–17]). Economic growth and development is based on the exploitation of billions of farmed animals, with now more than 70 billion land-based animals alone killed for consumption annually [18]. The strategies to respond to calls for the intensification of production work against the animal [6,19]. Wadiwel [20] conceptualises this process as a bio-political conquest, a war waged against animals. Within the logic of development and growth, so argues Rawles ([21], p. 211), "animal welfare concerns are not only different from the main concerns of sustainable development, but threatening to them". The risks for animals show no signs of abating with high profile researchers in the sustainability space repeating calls to manipulate the animal genetically and further intensify agriculture ([22], p. 9) without consideration of the consequences for animals widely described elsewhere ([17,20,23–26] [27], pp. 74–77) [28]).

Boscardin [6] details how the sustainable development agenda drives the "violent commodification" of animals to ever increasing heights. The process is called in industry terms "sustainable intensification" and is designed to advance the "Livestock Revolution" ([6], p.116): It envisages a "70 per cent upsurge in the demand for animal products by 2050, mainly driven by rising disposable income, population growth, urbanisation, and changing life styles" in emerging markets. It would increase the numbers of land-based animals suffering to approximately 120 billion per annum by 2050. Sustainable intensification promotes the biotechnological alteration of the animal's body to address environmental concerns and production efficiency [27,29], and the alteration of the animals' minds to reduce or eliminate sentience [30]. This is legitimised by the sustainable development agenda and facilitated by ideological means: The consumption of animals is normalised and misleadingly constructed as natural and necessary [6,31,32]. This expansion of the livestock sector is expected to have catastrophic impacts leading to more habitat loss, soil degeneration, resource depletion and water extraction [22]. Even Jim MacNeill, Secretary General of the WCED and lead author of the Brundtland report, proclaims in frustration:

> "I no longer shock easily but to this day I remain stunned at what some governments in their legislation and some industries in their policies claim to be 'sustainable development'. Only in a Humpty Dumpty world of Orwellian doublespeak could the concept be read in the way some would suggest." ([33], p. 167)

He goes on to explain that in 1987, they thought the concept was "plain enough" and "we defined it in several ways—ethical, social, ecological" ([33], p. 167). He emphasises that in the Brundtland report they stated "[a]t a minimum, [sustainable development] must not endanger the natural systems that support life on Earth: the atmosphere, the waters, the soils and the living beings". He regrets that only one definition of sustainable development "grabbed the headlines" and "stuck" to the exclusion of all others, which is the one about (exclusively human) intergenerational equity ([33], p. 168).

The time is long overdue to advance interspecies sustainability, a conception of sustainability that by definition and declared focus includes the concerns and interests of animals, their protection and their flourishing. It is recognised that the exploitation of nature and humans, and by extension, animals, result from the same "local and global economic development patterns that are also at the root of injustice, poverty, violence, and oppression" ([34], pp. 95–96). Addressing sustainability from the perspective of animal protection also advances sustainability for nature and humans. While there has been analysis in terms of the commodification of the animal and the social, political, biopolitical and economic factors facilitating their exploitation [20,29,32], proposals and descriptions of conceptions of sustainability that are inclusive of animal protection are fragmented and only beginning to emerge.

1.2. The Thoroughbred Industry in the Interface of Sustainability and Animal Protection

This study seeks to contribute to the advancement of such an interspecies conception of sustainability. It does so by, first, developing a framework of interspecies sustainability and second, by applying this framework to study the conceptions of sustainability held by individuals in senior positions in an animal-using industry, that is the international thoroughbred industry.

The thoroughbred industry is global in reach and is a significant animal industry practiced in 59 countries affiliated with the International Federation of Horseracing Authorities [35]. Its economic role is significant and it has political support which is expressed in government funding with the oversight of welfare being handed over to the industry itself. Governments' interest in regulating the industry is reduced to racing being a gambling enterprise. The racing industry also bears great cultural significance. Despite identifying itself as being steeped in tradition, the thoroughbred industry can be considered an industrialised industry [36]. The most significant parallel to the animal agricultural sector in relation to the current sustainability discourse concerns questions of animal welfare. Both industries are increasingly challenged by changing public attitudes to animal welfare [37–39]. In the US, there is even talk of banning thoroughbred racing in California due to a spike of horse deaths at Santa Anita Park, the alleged lack of significant action of the track operator the Stronach Group to protect thoroughbreds, and the possibility of a referendum in California [40].

The idea of sustainability is present in industry parlance, albeit sparsely and only in the form of "sustainable growth", "economic sustainability", "financial sustainability of the company" and similar. A connection between thoroughbred welfare (or lack thereof) and "sustainable growth" of the industry has been made in a report commissioned by the Jockey Club (US) in 2011 [38]. In terms of the consideration of thoroughbred welfare, it has been found that broadly, industry participants display a utilitarian approach [41]. It is acknowledged that there are individual differences with some sensing a deeper emotional bond with the horse and a deeper engagement safeguarding their welfare throughout breeding, racing and aftercare. However, overall, the industry's pursuit of welfare is reduced to the following three objectives: To address the most egregious welfare violations of industry practices on and off the track, to modify the public's perception of the industry and its treatment of the thoroughbred, and to focus on productivity, efficiency and optimisation of the commodifiable characteristics of the thoroughbred [41]. These foci echo the foci of other animal-using industries. Bergmann ([41], p. 130) concludes that it is doubtful that the thoroughbred industry's approach will result in net gains for thoroughbred welfare.

1.3. Overview of Aims, Article Structure, General Conclusions and Purpose of This Study

Calls for an interspecies sustainability have been issued, but to date, no attempt has been made to develop such a framework. This study set out to, first, develop such a framework based on the identification of relevant key concepts in the literature that specifically engages with the interface of sustainability and animal protection. Second, this framework is then applied to explore the conceptions of sustainability held by individuals in senior positions in the international thoroughbred racing industry, as well as to those held by animal advocates who campaign for thoroughbreds used in the racing industry. The aim of this study is to identify how the thoroughbred industry and animal advocates are situated in relation to interspecies sustainability and to explore what that might mean for this industry, the horses and for the advancement of interspecies sustainability overall.

This paper has discussed in Section 1 the anthropocentric sustainable development bias in the sustainability discourse and its consequences for animals used in animal agriculture and the broader planetary context. It next discusses in Section 2 the development of a framework for interspecies sustainability, identifying its characterising aspects. It presents three tables with three different foci summarising and contrasting the differences between anthropocentric and interspecies conceptions of sustainability: Table 1. Views of animals, their well-fare and the human-animal-nature interface (Section 2.1); Table 2. Interspecies relationships (Section 2.4), and Table 3. Overview of interspecies versus anthropocentric approaches to sustainability (Section 2.5). Section 3 discusses the scope of the empirical study, and materials and methods used. It includes a graphic outlining the data analysis process and demonstrating how interspecies sustainability is applied as a research paradigm (Figure 1, Section 3.3). Section 4 presents and discusses the results. It offers a model for situating thoroughbred racing and some of the relevant actors in relation to interspecies sustainability (Figure 2, Section 4.3). This model can be adapted to specific phenomena relevant for a particular industry utilising and exploiting animals. Furthermore, Section 4 identifies eight layers that are present within the discourse in the interface of sustainability and animal protection ranging from maintaining the status quo to reform and to transformation. Section 5 reiterates the main results, purpose and conclusions of this study.

The purpose of this comprehensive theoretical and empirical approach is to bridge the theory-practice gap, assist in policy development and to communicate to a broader audience. This audience is expected to include those interested in engaging with the relevant issues at the level of theory, to those advocating for animals, as well as to practitioners in animal using industries. This study provides tools to rethink the dominant sustainability and animal welfare paradigms. It assists with developing a vocabulary to engage with the intersection of sustainability and animal protection which to date has been underdeveloped. It is thus intended to be a call for scholars, animal advocates, policy makers as well as practitioners and activists, to take part in this discourse in an assertive and constitutive way to play their part in representing the interests of animals in the sustainability discourse.

In this article, in terms of nomenclature, the term sustainability is used to encompass ecocentric, biocentric and zoocentric iterations, and sustainable development as an anthropocentric concept is used when referring to specific industry, governmental and intergovernmental contexts. The term animal protection is used to refer to a holistic understanding of the protection of animals as discussed here under an interspecies sustainability paradigm. The term welfare is mostly used in the context of animal industry practices.

2. Framing Interspecies Sustainability

This section draws on writings that engage with questions in the interface of sustainability and animal protection and that are couched in the sustainability discourse, rather than environmental ethics or animal ethics specifically. The reason for this is to use established sustainability language that is understood by policy makers, industry and the broader field of sustainability studies to move it beyond the current stunted discourse of sustainability and critically reflect on mainstreamed sustainability concepts such as sustainable development. The writings drawn on include ecocentric perspectives and

publications in the fields of sustainable agriculture and food systems, and in animal studies and critical animal studies. Some relevant emerging themes are then explored drawing on ecofeminist perspectives that bridge between the spheres of sustainability, animal and nature protection by exposing systemic power imbalances. Analyzing the various critiques embedded in this literature, common themes emerge. These themes are cross-referenced for triangulation with conceptually formational texts in the sustainability discourse [1,4,42–45]. By then bringing these themes together within the interface of sustainability and animal protection, they describe aspects of an interspecies sustainability, the beginning of a theory of interspecies sustainability.

2.1. Ecocentrism as a Starting Point

A critique of anthropocentric conceptions of sustainability from the perspective of ecocentrism has always been part of the modern sustainability discourse. Many argue that only an ecocentric approach with its intrinsic values orientation has the potential to spark action to halt species extinction and climate breakdown [4,16,46]. Replacing anthropocentric with ecocentric approaches is considered the pathway to sustainability [46], and by extension, to the protection of wild animals. Washington ([4], pp. 6–16) refers to such sustainability orientation as the "old" sustainability that goes back to pre-history and the "Wisdom of the Elders" ([4], p. 8). This wisdom speaks of terms such as "harmony, balance, reverence, sacredness, spirituality, respect, care, witness, responsibility, custodianship, stewardship, beauty and even love" ([4], p. 8) in relation to animals and nature including its abiotic components. Interspecies sustainability is thus based on a number of general premises: the systemic interconnectedness and interdependency of humans, animals and nature; the existence of a mind-independent, inherent value bearing, ecological and biogeophysical reality that sets boundaries to human use of nature.

Washington et al. [46] state that those who support ecocentric perspectives overwhelmingly support inter-human justice, just as they support inter-species justice (ecojustice), for the non-human world. Ecocentric sustainability is thus founded on the principle that "caring for the Earth and caring for people are two dimensions of the same task" ([34], p. 95). The economy is considered to be situated within society which is situated within nature [47], rather than nature and society being situated within the economy. Ecocentric sustainability eschews the substitutability debate [1]. Such an ecocentric orientation is the nature of sustainability envisaged by civil society [48]. For an ecocentric sustainability to take hold and be maintained, anthropocentrism and human exceptionalism have to be contested and alternatives formulated for all spheres of sustainability. The interconnectedness and complexity of natural and social systems is always taken into account, and only the adoption of a systems perspective can do justice to that [43]. This has recently been reinforced by the UN Global Assessment of Biodiversity and Ecosystem Services [14,49] which supports Washington's [4] argument of the important role of indigenous cultures and their knowledge systems for the sustainability transition, in particular their knowledge of nature and animals. An ecocentric sustainability orientation is the starting point for the formulation of an interspecies sustainability.

Table 1 summarises the differences of our views of animals, their well-fare and the human-animal-nature interface under an interspecies versus an anthropocentric perspective of sustainability such as the sustainable development model. This should be read to apply to all animals, wild, liminal and domestic.

While ecocentrism has a lot to say about the conservation and preservation of nature, ecosystems and wild animals, and about what that means for enacting sustainability in theory and practice, it has limited guidance for, or interest in, the interface of sustainability and domestic animals, other than calling to fight against "the global scourge of animal agriculture" ([50], p. 138). The following Section 2.2 addresses this and discusses the emerging themes for domestic animals, which can be found in the discourse of sustainable agriculture and food systems.

Table 1. Views of animals, their well-fare and the human–animal–nature interface.

Interspecies Sustainability	Anthropocentric Sustainability
Animals as autonomous beings with a sense of self, purpose and needs based on their telos.	Animals as a repository, as bioreactor and production system for the benefit of humans.
Freedom to exercise agency.	Restriction and control.
Animals as embodied subjects of inter-and intra-species communities.	Animals seen as disconnected.
Animals with their own species-specific cultures and knowledge systems.	Animals as square pegs to be fitted into round holes for human purposes.
Respecting individual differences (of animals of the same species) in physiology, behaviour and appearance.	Optimisation of body and mind as needed for human purposes.
Respecting species-innate functional integrity and natural (and individual) limits.	Biotechnical manipulation to exceed natural limits, also at the expense of welfare.
Supporting those with individual differences and facilitating their participation in a fulfilling life.	Suppression and extermination of individual differences.
Acknowledging similarities between human and other animals.	Emphasising what distinguishes humans from other animals to justify a hierarchical order.
Respecting that nonhumans covet life, liberty, and the pursuit of happiness just as humans do.	Machine-like artifact to be controlled; Animals as non-sentient, or at best animals as primarily suffering beings.
Animal protection to apply to animal cultures, autonomy, self-determination, sense of control, fulfilling telos and the ability to create and maintain meaningful relationships.	In theory: Welfare rather than protection focusing on basic health and functioning, also recently on affective states, some considering natural living.
Recognising interdependence and reciprocity between animals, humans and the natural world.	Strict boundaries to separate humans from other animals and nature, human exceptionalism.
Precautionary principle (being mindful of limited knowledge of animal capacities).	Rejecting or minimising the potential for any breadth and depth of animal capacities.
Compassionate conservation, recognising the need to protect the individual from harm.	Conservation, focusing on species protection at the expense of individual animals and for the benefit of humans.
Nature and animals forming a self-sustaining and self-organising system.	Nature and animals as something to be managed.
Inherent worth of all species and nature including the abiotic components.	Instrumental view of all species and nature for human benefit.
Focus on present and future generations of all species and ecosystems, including their abiotic components.	Consideration of the nonhuman only in so far as they serve current and future generations human needs and wants.
Naturalness as inherent worth to be preserved.	Nature as "limiting factor" on human progress, preferencing technological and biomedical alteration.
Humanity regards itself as being immanent within an ecological system.	Human detachment and separation from animals and nature, nature/reason dualism.
Honouring qualities such as harmony, balance, reverence, sacredness and spirituality.	Belief in mastery, reduction to scientism, the rational, quantifiable, measurable.

2.2. Themes Emerging from the Discourse in Sustainable Agriculture and Food Systems

2.2.1. Species-Innate Functional Integrity

Animal welfare gains particular relevance in the discourse of sustainable agriculture that adopts a systems perspective. An important concept emerging here is functional integrity (of a

self-regenerating system), a concept adopted from ecology [51]. Thompson [51] applies functional integrity to extensive livestock farming in their interaction with biological systems, and to the social systems that sustain animal agriculture or are impacted by it. Thompson and Nardone [52] also apply it to the individual animal in the context of biotechnological interventions. They argue to shift the focus from resource efficiency approaches (i.e., biotechnological manipulation) to functional integrity approaches. Thompson [51] stresses the need for clarity about the weighting of values that guide decisions leading to preferencing functional integrity or resource efficiency. The author of the current study argues that functional integrity needs to be clarified to mean the species-innate functional integrity, and not one that is constructed via biotechnological means. Presumably, this is what Thompson [51] and Thompson and Nardone [52] had in mind, but it needs to be emphasised to guard against misappropriation. To mark this differentiation and for simplification for the following discussion, this author introduces the concept *functional integrity+*.

While animal welfare is considered a constituent systems component of sustainable agriculture, most, including Thompson [53], do not see it as a sphere of sustainability in its own right. For Thompson, it is about the socio-cultural co-creation of agriculture inhabited by humans and animals. Others subsume welfare under the social pillar based on the realisation that the growing gap between the realities of animal agriculture and societal expectations in terms of animal welfare represent a risk for animal agriculture [8,54,55]. The discourse in the interface of sustainable agriculture and animal welfare under the socio-cultural domain is aimed at maintaining animal agriculture's social license to operate, that is, it is about efforts to maintain the public's acceptance of its operations [8]. As a consequence of the public's increased concern for farm animal welfare, welfare has been turned into a commodity in itself [56,57]. This has implications for farm animals, since, as Buller and Roe ([57], p. 148) suggest, "emphasis [is] placed on those welfare elements that lend themselves more immediately to calculability, creating an implicit tension with those that do not so lend themselves." A focus on functional integrity however, including *functional integrity+*, while important and mostly measurable, is a very limiting conceptualisation of animal protection. Next follows the discussion of other aspects as they emerge in the literature that engages with domestic animal welfare in the sustainability context.

2.2.2. A Holistic Conception of Naturalness

Another important theme that emerges in this discourse is naturalness, and importantly, the fact that people value naturalness when it comes to assessing animal welfare [58]. Studies show people interpret naturalness to relate to behaviour that the animal is able to perform, as well as to any practices imposed on the animal, for example in terms of husbandry including feeding practices, veterinary and breeding practices. The welfare discourse however diminishes the idea of "naturalness". Animal welfare science defines naturalness as relating to animal behaviour only [59]. Fraser ([60], p. 2) somewhat acknowledges this difference in interpretation of the term when he states the term naturalness predominantly reflects the views of social critics and philosophers, whereas farmers and veterinarians use the term to represent a view that defends practices such as the confinement of animals.

This author argues for a holistic interpretation of naturalness. This ties in with eco- and zoocentric perspectives, with the critical discourse of animal welfare, and with how people not familiar with the animal welfare science discourse intuitively interpret the meaning of naturalness. To signify this holistic reading, she introduces the concept *naturalness+*. Naturalness, or better *naturalness+*, needs to be leveraged more in the animal protection discourse.

2.2.3. Social Justice and Moral Egalitarianism

A further theme is the extension of the social justice dimension of sustainability and sustainable development to farm animals. Some explicitly introduce the term interspecies sustainability, implying the end of the exploitation of farm animals [61,62]. Probyn-Rapsey et al. [62] realise sustainability as such is not an anthropocentric concept, rather, it is a concept that is used based on "unreflective anthropocentric understandings of 'sustainability'" ([62], p. 115). They advocate adopting expanded

sustainability frameworks to include interspecies ethics "as part of sustainability's social justice remit", and thus extend the application of social justice principles to other than human actors ([62], p. 115). Similarly, Narayanan [63] introduces the concept of "sociozoological justice" arguing for a species-inclusive sustainable development.

Vinnari and colleagues foreground animal protection within the frames of food system sustainability and security, and governance for transition to sustainability [64,65]. They argue for a four pillars model of sustainability with animal protection a separate pillar [65] as proposed earlier by Rawles [21]. In one of their most comprehensive and integrative deliberations on the topic, Vinnari et al. [65] advance an ethical evaluation tool whereby they extend the sustainability objectives of moral egalitarianism to both, farm animals and wildlife. They [65] developed a Sustainability Matrix "based on the three main strands of ethical theory (utilitarianism, deontology and moral egalitarianism) and the three associated sustainability objectives of efficient allocation, sustainable scale, and fair distribution". This framework is inclusive of both human and non-human animal interests and promotes equality between humans and animals. Wild animals and their habitats are included on the basis of them being threatened by animal agriculture. This framework has potential for further development and far reaching policy applications.

2.2.4. Relationality, Agency and Intentionality

Finally, there are the dimensions of animal agency and human-animal relations. As Twine ([29], p. 166) notes, "human-animal relations are highly significant when it comes to defining what sustainability is and how to achieve it". Twine ([29], p. 162) argues that human and animal flourishing need to be conceived as "variously interdependent" (see also [66]). Furthermore, Buller and Morris [67] suggest our approach to welfare needs to be more individualistic taking greater account of human-animal relationships which are in essence affective and interactive. They argue that farm animals become part of the sustainability project whereby it is not about their management in groups and herds by humans, but "as a result of the relationality between their own individual intentions, behaviour, agency and use of space and nature (however limited these might be) and those of humans" ([67], p. 146). Buller and Morris ([67], p. 146) suggest to conceive of agricultural sustainability as a "collective endeavour of a relational community". Rural spaces and their sustainability are reinterpreted as co-evolving based on "animalian agency and intentionality" rather than exclusively human agency and intentionality. They hope this outlook assists in drawing attention to farm animals' needs, rights and welfare, and giving animals a voice. A view that considers relationality and animal agency (and intentionality) inherently regards the animal as an actor who does something rather than being the passive recipient acted upon by humans. These dimensions help to illuminate the concept of interspecies sustainability and are discussed further below.

2.3. Telos and the Turn toward the Individual

The themes identified above including *naturalness+*, interspecies or sociozoologic justice, species-innate functional integrity (*functional integrity+*), relationality and animal agency are defining criteria for interspecies sustainability. They converge in the concept of telos [68] and bring new meaning and significance to it. Telos is a useful concept to be incorporated in our understanding of interspecies sustainability. It "derives (philosophically) from Aristotle and is a way of accounting for the good life of an animal from the unique speciesness of the animal in question" ([68], p. 691). It means all that matters in life for a particular animal based on their species' needs, giving capacity to becoming, as a foal becoming a grown horse, an evolution through the animal's own life, with a certain end purpose without which, as Harfeld ([68], p. 694) explains, "any description of the beings involved would be inadequate". Simply put, telos refers to the "pigness of the pig" ([68], p. 706) and the "horseness of the horse".

It is argued here, however, that telos needs to go beyond that to refer to an individual's (not only the species') particular needs, predilections and abilities, and individual limitations. This perspective

takes account of respecting and protecting particular groups of animals, for example those who have been bred for specific purposes but then do not fulfil human expectations, or animals with disabilities. Indeed, to more comprehensively describe interspecies sustainability, many argue it would need to be less species- and more individual animal-focused [69]. A turn to the individual is evident in ecology and ethology, and in the case of wild animals, it means replacing conservation with compassionate conservation [70]. It is also been referred to in animal agriculture, for example, above by Buller and Morris [67], and is beginning to occur in animal welfare science [59]. For the purpose of this study, this author therefore introduces the concept of *telos*+.

2.4. Ecofeminist Perspectives Foregrounding Animal Agency and Interspecies Relationality

Animal agency also means that from the human perspective, the human–animal relationship is not to be taken for granted. Seminal issues to be addressed for the evolution of an interspecies sustainability are the human uses of animals, and the relationships between humans and nonhumans that have evolved as a consequence of these uses. While critical animal studies scholars regard human–animal relationships inherently as unequal and oppressive for the animal, feminist animal studies scholars believe "our relations with domesticated species [are] complex and contradictory, and open to other possibilities" ([71], p. 43) allowing all species to flourish. There is the view of a social relational approach, co-constituted by the other species.

Animal agency and relationality assist in describing what it means that the animal is included and understood as both a subject, and importantly, a co-creator of the conditions required for interspecies sustainability. For this to be able to occur, the inequality of power relationships between humans and nonhumans need to be addressed. Ecofeminism has significant contributions to make in understanding interspecies sustainability. Plumwood [72] argues a focus on the larger social, political and historical contexts in which nature and humanity are situated is essential. This context laying bare the mechanisms for human, nature and animal oppression, demonstrates that interspecies sustainability has to be based on a set of inviolable criteria and core values, such as upholding democratic systems, universal rights, dignity, transparency (the right to know) and the precautionary principle [48], which are to be extended to the nonhuman. Hierarchical distinctions between humans and more-than-humans are to be dissolved. Humans are to recognise themselves as inextricably immersed in relationships with nature and others, in ways that acknowledge difference. Such relations value "the other's boundary and opacity of being" ([73], p. 178). This implies that the flourishing of animal agency needs to be allowed to happen, and be facilitated, in respect of animal sense of control, identity, autonomy, integrity of body and mind, meaningful relationships and subjectivity. It also reminds us of the importance of valuing and protecting animal knowledge systems and species cultural practices [74]. Table 2 summarises the differences in the quality of the interspecies relationship between an interspecies and anthropocentric-focused sustainability conception.

Enactment of animal agency and human–animal relationality requires interspecies cooperation and mutuality, and Plumwood [73] argues this can only be implemented in the form of radical democracy. Evidently, matters of representation and participation of animals are of great importance for an interspecies sustainability, and models to draw on are available [75–77] but their discussion is beyond the scope of this paper.

2.5. Summary Interspecies Sustainability

The key aspects identified above in this Section 2 converge to describe and frame interspecies sustainability as follows: The building block is ecocentrism, with ecocentrism being extended to reveal and eliminate asymmetries, take account of intra- and interspecies relationalities and incorporate a focus on the individual (and smaller groups for that matter), rather than a limited focus on species only (*ecocentrism*+). *Ecocentrism*+ is complemented with an extended conception of telos (*telos*+). Telos in itself is identified as a concept that integrates a variety of aspects, including species-innate functional integrity (*functional integrity*+), interspecies justice, relationality, animal agency, animal cultures and

knowledge systems, and a holistic conception of naturalness (*naturalness+*). As with ecocentrism, telos needs to extend beyond speciesness to include an individual's particular needs, predilections, abilities and individual limitations (*telos+*). Finally, interspecies sustainability also means adherence to a set of inviolable criteria and core values, such as upholding democratic systems and principles, universal rights, dignity, transparency and the precautionary principle as important dimensions in governance and decision-making, and to be extended to all species.

Table 2. Interspecies relationships.

Interspecies Sustainability	Anthropocentric Sustainability
Interspecies equity based.	Hierarchical.
Relations and partnership based, reciprocal.	Domination by humans.
Respecting otherness.	Using otherness to justify devaluing the other.
Interdependence.	Separation.
Respecting boundaries of privacy and "letting them live their lives".	Ongoing intrusion and invasion.
Nonhumans and humans as embedded in networks of socio-ecological relationships that matter to them.	Alienation and separation or negation of animal to animal, and animal to human relationships.
Species inclusive ongoing dialogue and co-evolutionary.	Prescribed by hegemonic forces and technological means.
Ongoing re-defining, with animals sharing the re-defining equally.	Human control with strict boundaries.
Mutually and culturally defined.	Technocratically and economically defined.

To conclude this section, an overview of interspecies versus anthropocentric approaches to sustainability is presented in Table 3.

Table 3. Overview of interspecies versus anthropocentric approaches to sustainability.

Interspecies Sustainability	Anthropocentric Sustainability
Flourishing of telos including animal agency, animal cultures, naturalness, dignity, identity, subjectivity, autonomy, species-innate functional integrity.	Animal and nature a renewable resource and a manipulable repository for human benefit.
Nonhuman and human co-creating realities and relational flourishing.	Separation from animals and nature.
Interspecies justice.	Intergenerational (human) justice.
Inherent value of animals and nature (including abiotic elements).	Consideration of the nonhuman only in so far as they serve current and future generations human needs and wants.
Obligations to nonhumans and ecosystems.	Obligations predominantly to human welfare, inadvertently overlooking or deliberately rejecting the interests of other than human interests.
Eschews the substitutability debate.	Based on varying degrees of substitutability.
Species equity, no special moral status of humans.	Human exceptionalism.
Largely based in preservationism—to protect, preserve and restore natural systems.	Largely based in conservationism ("wise use" to benefit humans).
Emphasis on culture (i.e., guided by questioning what is it that truly sustains us?).	Technocentrism, technocratic approach with emphasis on the economy and materialism.
Systems perspective, ecological system oriented.	Reductionism, linearity.
Transparency: values to be recognised and made transparent, discourse about values for decision-making.	Values undisclosed, or purportedly values free.
Decolonising animal knowledge systems, indigenous knowledge systems, and local knowledge; leading to co-production of knowledge; Transdisciplinarity.	Specialist expert knowledge oriented; fragmented knowledge silos.
Growth critique; zero growth/de-growth.	Adherence to the growth paradigm, mistaking growth with progress.

In the following, this framework of interspecies sustainability is employed to study the thoroughbred industry as a template to demonstrate the wider applicability of this approach to interrogate other animal-using industries.

3. Materials and Methods

3.1. Scope of This Study

This research is part of a larger study that investigates the sustainability of welfare concepts and the future for thoroughbreds in the international thoroughbred racing industry. An earlier publication of aspects of this study [41] explored how representatives of the thoroughbred industry in senior administrative and regulatory roles define thoroughbred welfare, what they consider to be the main welfare issues, what their ethical underpinnings are, and what this might mean for the welfare of thoroughbreds. The analysis of industry perspectives was cross-referenced with those held by representatives of animal advocacy organisations who were also interviewed for this research. This current article explores how the same industry informants conceptualise sustainability, how they see it being related to thoroughbred welfare, and what they consider to be the barriers, threats and drivers for sustainability of their industry. The industry informants' conceptions are again compared and contrasted with those of animal advocacy informants. The aims of this part of the study are to better understand where and how ideas of sustainability and welfare converge, what the likely differences in conceptualisation of sustainability between the two groups of informants are, to find out how the thoroughbred industry is placed to respond to an interspecies sustainability paradigm, and what the opportunities and prospect are for advancing interspecies sustainability, in thoroughbred racing and other animal industries.

Economically, materially and systemically, the thoroughbred breeding, racing and the betting sectors are deeply entwined and dependent upon each other. Within the scope of this study the betting sector is not specifically considered although it can be expected to be addressed by the informants in the context of economic considerations and is treated as such in general terms in this study. The issue of breeding has significance in the context of one of the key aspects of interspecies sustainability, namely naturalness. The thoroughbred industry vehemently protects the process of "natural gestation" to produce an "eligible foal" ([78], p. 51). For registration in the studbooks and to be allowed to participate in breeding and racing in any jurisdiction aligned with the International Federation of Horseracing Authorities, the thoroughbred on both the mare's and the stallion's side has to be of recognised thoroughbred pedigree, be conceived by "natural" means and the foal has to be carried and born from the body of the same mare in which it was conceived ([78], pp. 50–51). Any foal resulting from or produced by the processes of artificial insemination, embryo transfer or transplant, cloning or any other form of genetic manipulation is not eligible for recording in a Thoroughbred Stud Book approved by the International Stud Book Committee ([78], p. 51). The context of this is discussed more broadly by McManus et al. ([36], pp. 172–184). While the industry has appropriated the idea of "natural" for breeding, the process of breeding and its preparation are highly controlled and invasive for the horses involved. These interconnections are the subject of an article in preparation. In this current article, issues around breeding are not specifically addressed except in instances where informants specifically refer to them within the scope of the questions analysed for this part of the larger study.

Thoroughbred breeding and racing are distinct from each other in many ways [36], but an investigation of this distinction is also beyond the scope of this article. The umbrella term "the thoroughbred industry" or sometimes simply "racing" is used here to encompass both on the basis of the deep entanglements.

It should also be noted that while there are differences in regulation and risk factors between racing jurisdictions, due to the scope of this article, these are not considered in greater detail unless they contribute to the understanding of a particular argument being made. It is also recognised that

the industry is working towards national and international harmonisation of the Rules of Racing. To this end, the International Federation of Horse Racing Authorities [79] identifies and promotes industry best practice in the administration of horseracing worldwide. Therefore, the thoroughbred racing industry can be referred to in general terms, whilst also considering relevant national differences emerging in this study ([41], p. 121).

3.2. Informant Recruitment and Response

Thirty-seven administrative and regulatory bodies of the thoroughbred industry in Australia, the UK, Ireland, New Zealand, the US and Hong Kong were contacted via email. Sixteen did not respond after follow-up emails and thirteen declined. Eight industry participants from seven organisation and one individual at the time of the interview not affiliated with any organisation, from Australia, the US and an international body, agreed to participate. Animal advocacy organisations who published information in relation to thoroughbred racing on their websites that indicated a degree of expertise in relation to thoroughbred protection matters were contacted. No such advocacy organisation could be identified for Ireland or Hong Kong, but thirteen in Australia, New Zealand, the UK, US and one international organisation were contacted. One organisation declined stating they lacked the expertise to comment. Three did not respond but seven based in Australia, the UK and the US agreed to partake, bringing the total number of interviewees to sixteen (Table 4).

Table 4. Descriptive data of research informants.

	US	AUS	UK	Int'l	Total
Thoroughbred Industry Informant	5	3	-	1	9
Animal Advocacy Informant	2	3	2	-	7
Total	7	6	2	1	16

The industry informants are in senior and executive roles in their organisations, in regulation, general management, development, marketing and communications, and as a board member. The organisations include breeders, racetracks, jockey clubs, regulatory bodies, and national and international bodies. The informants' background includes training and experience as veterinarian, in science, agricultural and applied economics, law, management, insurance and broadcasting. All have a long history of involvement with racing in some form or another. Some are, or were, owners or breeders of racehorses. The animal advocacy informants were employees of their organisation, some in executive roles, others in scientific or animal welfare advocacy roles, again others were affiliated as consultants.

It is worth noting that in the US, there is a broader spectrum of industry bodies who were more incentivised to participate in this study than in any of the other nations. Subsequently, as found in this study, informants from the US were also more forthcoming in naming the thoroughbred welfare, and the cultural and economic challenges faced by the industry, than were industry informants from Australia.

The difficulty in recruiting racing industry participants for research that is associated with thoroughbred welfare has also been experienced by Butler et al. [80,81] despite their studies having been funded and supported by the UK racing industry. Given the controversy surrounding welfare in racing and the defensiveness of racing commentaries, it is not surprising that an independently funded study is responded to with disinterest or apprehension. At the design stage of this study, the author was cautioned by some in Australia familiar with the racing industry and involved in researching aspects of the racing industry to avoid the term "welfare" altogether. Butler et al. [80,81] have recruited eleven industry groups including trainers, stable staff, veterinarians, animal charity employees and veterinary officers and inspectors of the British Horseracing Authority. Butler et al. [80,81] demonstrate that a carefully facilitated focus group process encourages discussion of animal welfare issues with industry participants, including trainers and veterinarians. But it also seems fair to assume that those who have

agreed to participate in Butler et al.'s studies [80,81] are self-selected on the basis of willingness to discuss welfare. In contrast, this current study is aimed at obtaining the views of senior administrative and regulatory informants. Many of them at that level have recognised the need to engage proactively with thoroughbred welfare and the social context.

The protocol for this study has been approved by the University of Sydney Human Research Ethics Committee (HREC), Project No.: 2016/019, on 22 January 2016. All informants gave their informed consent for inclusion before they participated in the study. They were informed that participation is voluntary, that they are under no obligation to consent, that if they did consent, they could withdraw from the research at any time and that there will be no consequences for them if they did withdraw. Study participants were also informed about the purpose of the study, who is carrying out and who is funding the study, what participation involves for them including time requirements, and methods of data collection and storage. Study participants were informed about the complaints procedure and they were supplied with contact details if they required further information. Data were collected with the understanding of confidentiality. All care is taken in the dissemination of results to ensure individuals cannot be reasonably identified.

3.3. Data Collection and Analysis

Semi-structured interviews were conducted via telephone and Skype, between February and August 2016. The interviews took approximately one hour, except in two instances when they took 105 min. One of these instances involved two informants of one organisation who requested to be interviewed together in a group interview via telephone. The interview sections relevant for this article were designed to elicit the informants' definitions of sustainability and their understanding of the interface of sustainability and thoroughbred welfare. They were also designed to enable participants to express their priorities, what they consider to be the drivers and barriers in terms of advancing the sustainability of the industry, and matters of racing integrity, regulation and transparency in relation to welfare. One key concept of interspecies sustainability was included in the interview schedule, that is, *naturalness*. The intention was to find out whether the concept is known, how the informants conceptualise it and what relevance it has in their thinking about the interface of sustainability and thoroughbred welfare.

The concept *naturalness* has been chosen for several reasons. First, it was assumed that even if *naturalness* is not part of the informants' vocabulary, they would be able to express some intuitive understanding and assumed relevance of the idea of *naturalness* in relation to welfare since, as studies have shown, the idea of *natural* is an important one for those unfamiliar with welfare science concepts [58]. Second, *natural horsemanship* is known in equestrian circles as promoting the idea of partnership between the human and the horse [82,83] and so it was assumed that at least some informants would be able to relate to an idea of *naturalness* in relation to horse welfare. The inclusion of more key concepts is beyond the scope of this study. However, it was expected that the relative importance and conceptual inclusion of other key concepts by the informants could be identified inductively from the data.

The interviews were audio recorded, transcribed verbatim and imported into NVIVO version 11 for coding and querying. Qualitative content analysis was applied to the data analysis [84,85]. The approach was hermeneutic which entails an understanding of the context, attention to the social context and the subject matter, the controversies and current events and directions in thoroughbred racing and thoroughbred welfare, and an understanding of the potential impact each informant's perspectives and proposed actions have on thoroughbred welfare ([84], pp. 560–561). Thus, the thoroughbred was centred, rather than the perspective of the interviewee, as is generally the case under a hermeneutic approach. This means also that the paradigm of interspecies sustainability itself was used as an analytical framework. The main analysis processes deployed were immersion in the data through coding, constant comparative analysis between meaning units, coding units and larger transcript passages, and writing.

Triangulation was another important process. It was deployed in three ways: First, analysis was undertaken using different analytical procedures described in this section. Second, it was undertaken by keeping abreast with current events in the international thoroughbred racing industry and with activities and public statements of relevant racing bodies, in particular those with which the informants are affiliated. Third, triangulation was part of the process of comparing and contrasting the responses of the industry informants with those of the animal advocacy informants.

In the first round of coding in NVIVO, the approach was deductive. The data was coded as per the items of the interview schedule that are relevant for this article. This includes the following codes (*nodes* in NVIVO): Definitions of sustainability, links to thoroughbred welfare; priorities for industry sustainability; drivers of sustainability; threats and barriers; governance; stakeholder engagement; safety and integrity; naturalness. An interim level of analysis considered manifest and latent content by applying the dimensions of sustainability that emerged from the data, namely the socio-cultural and the economic dimensions, and linking them to thoroughbred welfare. This data was written up in narrative format. It was a way of "putting the data back together" that had been fragmented due to the coding process, under overriding themes (the two sustainability dimensions), while constantly referring back to the relevant sections in the interview transcripts to ensure consistency. This writing process is a recognised analytical process in its own right. The narrative served triangulation with other findings emerging from further analytical procedures. Following further rounds of reading and querying of the data in NVIVO, it transpired that it was necessary to use a tool to compare and contrast data of all informants in table format. Relevant data was then entered into Excel and new codes were derived inductively. All codes are descriptive rather than analytic. For coding, manifest as well as latent content was identified.

Four of the codes in Excel were treated as meaning units ([85], p. 11). Meaning units were condensed to distill the essence of what has been said making them more manageable by reducing noise. This facilitated constant comparative analysis between the responses of all informants, but also within the individual informant's responses. Coding in Excel resulted in eight sheets for thoroughbred industry informants with each sheet representing a first level code or meaning unit. The relevant responses of each informant were sorted into cells under one to nine second level codes on each sheet. For animal advocacy informants, seven sheets with three to five second level codes and condensed meaning units (essence) were yielded. Analysis by column, rows and cells allowed for an iterative process and a conversation with the data to grow, and a narrative to develop. During this constant comparative process, it was also necessary to regularly refer back to the interview transcripts for contextualisation of the data fragments and to ensure consistency.

The data analysis process, approach and paradigm are summarised in Figure 1. The coding tree including meaning units for industry informants and one for animal advocacy informants are included in the Supplementary Materials (Figure S1). As examples of raw data, the thoroughbred industry informants' definitions of sustainability are available in Table S1, the animal advocacy informants' definitions of sustainability are available in Table S2, and the essence of the meaning unit "priorities" of the industry informants in Table S3.

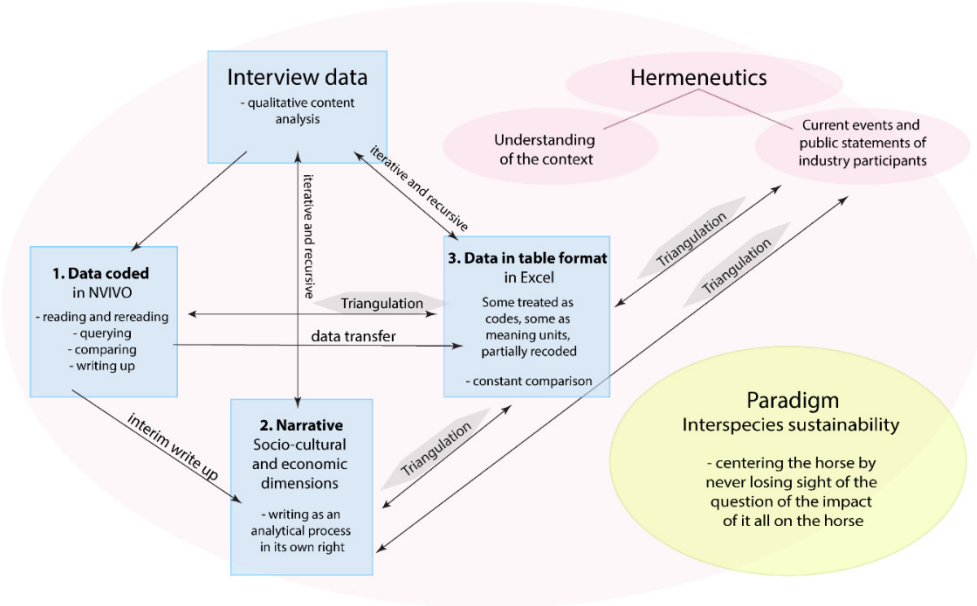

Figure 1. Data analysis process, approach and paradigm.

4. Results and Discussion

4.1. Industry Informants Defining Sustainability

Definitions of sustainability offered by industry informants range from the textbook-like entry of what is known as sustainable development: "the continuing development of the environmental, social, economic aspects for generations to come", to a narrowly pragmatic version describing the lowest common denominator: "the thoroughbred industry of course has to [be able to] maintain itself [in terms of generating the funds needed] for prize money, infrastructure, workplace health and safety, upgrades for welfare and safety". Predominantly, sustainability is defined in economic terms. An executive of a racetrack operation refers to sustainability as "the ongoing vitality of the industry as a whole", stressing that the "economics drive the vast majority of it". A counterview offered by some suggests that the socio-cultural dimension has more relevance than the economic one.

Importantly, industry informants see systemic connections between the economic and the socio-cultural domains, between racing and society at large, as well as within the industry. They are conscious of the link between the public's perception of thoroughbred welfare and the sustainability of the industry. They also recognise a cultural embeddedness of racing within certain sections of the population and this embeddedness immunises the industry to a certain degree, as an Australian informant argues, the "love of the horse and the love of the sport" guarantees that racing "will continue on generation after generation" and, so she argues, this cultural embeddedness outweighs any potential threat from "an extreme level of anti-racing feeling amongst some people". But industry informants also recognise the existing culture within as a risk for the industry. A US informant, for example, mentions the Horsemen's Benevolent and Protective Association (HBPA) who represents the majority of trainers in the US. He states, "the best way to describe them is they are kind of like cowboys. They don't take kindly to other people telling them how to run their farm." He describes them as "obstructionists" who have "the most cultural change to make". They represent "a generation of horsemen [who believe] that medication is the answer when there are clearly other means that are better for the horse in the long-run."

Industry informants agree thoroughbred welfare is indispensable for the sustainability of the industry for two reasons: Racing integrity and public perception of welfare. It is also evident that industry informants do not consider thoroughbred welfare a sustainability domain it its own right. They focus on the public's perception of welfare but there is less evidence that they aim to

advance sustainability through addressing thoroughbred welfare at a broader level. Accordingly, despite an understanding of the cultural problems within the industry, industry informants focus predominantly on solutions based in the marketing space and the technological realm. To advance the sustainability of the industry, most industry informants name as a priority attracting more owners and breeders to address the shortage of this group of participants, next is attracting "the next generation of consumers", promoting racing "as equally exciting and interesting as American football", advancing digital marketing strategies, protecting racetrack infrastructure, addressing safety and integrity overall, and in the US in particular introducing medication reform.

4.2. Thoroughbred Advocacy Informants' Discomfort with "Sustainability"

Some thoroughbred advocacy informants express discomfort about linking sustainability, welfare and thoroughbred racing. An Australian informant, for example, believes that the industry neither will nor should continue "in perpetuity", because the industry is struggling to address welfare. She believes they focus on the visible aspects such as "death and killing on the racetrack" but this is only a "minimal part", the "very public part" of welfare. She emphasises that the industry needs to address "wastage" and the "everyday life of horses" which is what the "real welfare issues" are, "things they are doing not very much at all about". Dismissing discussion of sustainability, another Australian informant states, her job is not about sustainability but about improving welfare "as long as horses are used in racing", and "if racing stopped tomorrow, that wouldn't be a problem".

One of the informants from the UK suggests the industry itself considers welfare relevant only in so far as it relates to "optimal race day performance and breeding capability". He believes that for the industry, the intersection of sustainability and welfare is about "sustaining the industry through producing vast numbers of horses to race them competitively but maintain a welfare standard that will allow them to perform at their optimum". He suggests in that system, sustainability can only be achieved by "producing vast numbers of horses [which are] then thrown at, ruthlessly, at an industry where some succeed and many don't." This advocacy informant seems to describe breeding of large numbers of thoroughbreds as a pillar of the industry's model of sustainability which, as he adds, ultimately is unsustainable. Indeed, this model of breeding is recognised as leading to "wastage", that is horses leaving the industry (or not even making it to the track) for various reasons, representing a significant welfare issue because their future is uncertain and often leading to premature death [86].

Although another advocate, also based in the UK, claims that "in general terms, thoroughbred welfare is well catered for" in the UK, his view is an outlier. Most advocacy informants argue thoroughbreds are exposed to unacceptable systemic risks in racing and training. Still, most do not expressly lobby for a ban on flat racing. One of the rights-based advocacy informants states her organisation believes reform is possible. Three advocacy informants, two based in the UK and one in the US, seem to support the existence of the industry in principle as long as the industry demonstrates that they work on improving welfare.

Advocacy informants agree that the continued existence of racing depends on thoroughbred welfare, and on meeting public expectations for welfare. Significantly, a US advocacy informant states "the problem with the racing industry is that they believe it is a problem of perception, when it is a problem of reality". Advocacy informants do not critique the concept of sustainability as such, and seem to share the definition of sustainability as predominantly referring to economics and not including thoroughbred protection as an end in itself.

4.3. Situating Thoroughbred Racing in Relation to Interspecies Sustainability

Figure 2 visualises the situating of thoroughbred racing and some of the relevant groups in relation to interspecies sustainability, and what this means for thoroughbred protection. This figure has been developed based on the interview responses, and informed by way of triangulation with other background readings in the academic and grey literature, thoroughbred industry online news outlets,

and, in particular, with Bergmann's study [41] of the informants' conceptualisations of thoroughbred welfare. The following presentation and discussion are threaded along this figure.

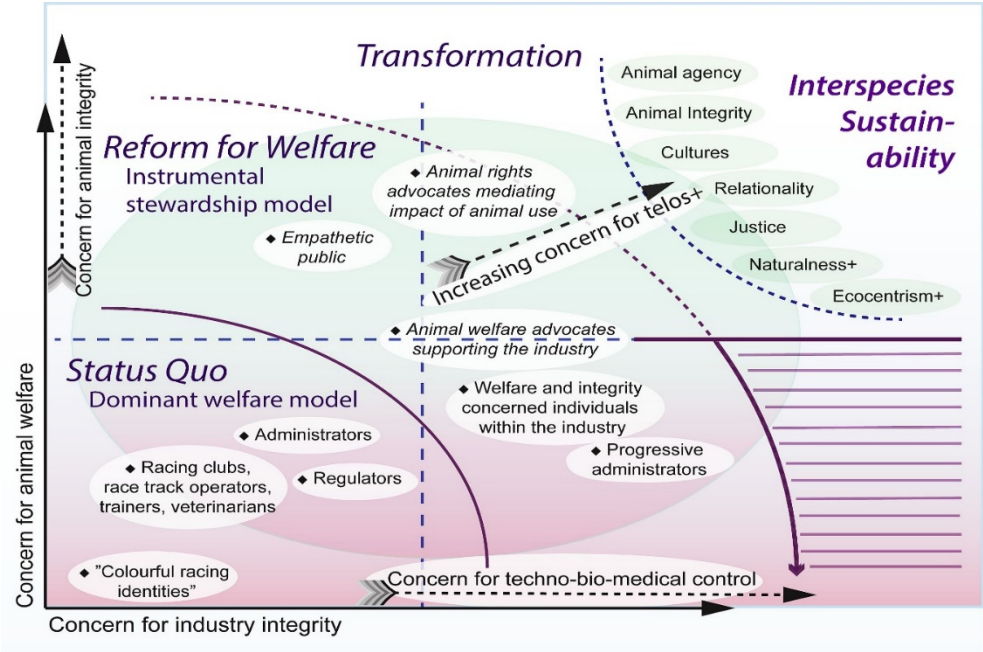

Figure 2. A model for situating thoroughbred racing in relation to interspecies sustainability.

4.3.1. Concern for Industry Integrity and Techno–Bio-Medical Control

The *x*-axis of Figure 2 represents industry concern for racing integrity. It appears that integrity is the main concern and thoroughbred welfare is a by-product when integrity is being taken care of, although one industry informant based in Australia objects to that suggestion. He claims that racing integrity and equine health and welfare are of "equal standing", and there is "significant cross over". As he continues to explain, "if we talk about investment in integrity systems and … the detection of drugs … you don't want people to cheat and compromise the integrity of the race. At the same time, by stopping them [using] drugs, you are by default protecting welfare because that horse isn't [running] with drugs in its system." Overall, track surface is the dominant topic for safety, and drugs for integrity, with drug use making it possible to race unsound horses and to enhance performance.

The dominant welfare model is situated in the lower left quadrant. The majority of industry participants is situated in that lower left quadrant, with integrity being of some concern, and some may be truly concerned about the welfare of the horse. But mostly, there is ongoing resistance to welfare reform from the bottom up, such as resisting racing authorities' efforts to reduce the use of the whip or to ban it [87], or resistance to medication reform [39]. Most industry informants refer to certain individuals or groups of people who they see are corrupting the integrity of racing and compromising thoroughbred welfare. For example, an informant based in the US states there will always be "a certain percentage of awful people... Greed and corruption exist" which he regards simply as a "reflection of cross-section of society, there is good and there is bad, there is competent and there is incompetent and you just hope the good outweighs the bad every single day." Industry commentators refer to some of them as "colourful [racing] identities" [88].

Veterinarians are included in the lower left quadrant, although, as with trainers and owners, this group is not homogenous. Both, an industry and an advocacy informant based in the US, refer to the economic model driving veterinarians' behaviour. As an informant affiliated with a racing operation in the US states, "veterinarians here are paid to administer medication, " … very rarely … they get paid when they actually perform an analysis of the horse." A US-based advocacy informant goes a step further and claims "the veterinarians are the enemy of horse welfare"; at the track, "they are there

by the dozens... with their pickup trucks full of medication. And they are the ones selling those drugs to keep the horses running. And they are the ones convincing trainers and owners that these horses need this medication." Indeed, a White Paper of the American Association of Equine Practitioners (AAEP) identifies the economic model for veterinarians in the US as problematic ([89], p. 9), and it is being questioned in other racing jurisdictions. While veterinarians are implicated in fraudulent conduct and breaching the rules of racing [90,91], their position within the rules of racing is also being questioned. For example, the AAEP themselves is supporter of administration of the drug furosemide, including on race day. Furosemide is administered to more than 90% of horses in the US on race day to address exercise induced pulmonary haemorrhage (EIPH, bleeding from the lungs [92]), despite it being highly contested, despite it being considered to be a performance enhancer and despite its risks to horse welfare [93]. In other jurisdictions including the UK and Australia, furosemide is not allowed on race day, but it is during training. The AAEP reinforced in 2019 their position statement in support of the use of furosemide on race day to control EIPH [94]. Investigating how training and racing can be adjusted to prevent bleeding from the lungs without the intervention of drugs has not been on the agenda of the AAEP or regulators. Instead, the AAEP advocates for research and development of new treatments to help prevent and/or control EIPH. Drugs are being constructed in the interest of horse welfare and euphemistically referred to as "therapeutic medications". The contestations around furosemide and the position taken by many veterinarians in this matter are only one example of why an industry informant as well as an advocacy informant express a critical perspective on the role of racing veterinarians. It is also well-known within the industry that veterinarians are challenged with the business and ethics of racing and their role within that context, a topic of a seminar conducted by Racing Victoria in 2014, and of a symposium for veterinarians, trainers and owners in Germany in 2015. Veterinarians for horses in sport and entertainment are exposed to pressures and expectation of owners and trainers [95] and an often-cited position of veterinarians is, "if I don't do it, someone else will" [96].

The industry informants participating in this study appear to be situated in the welfare reform area of Figure 2, in the lower right quadrant. They are engaged in aspects of reform and maintaining or improving the integrity of racing, they are welcoming of improved systems for safety and integrity, or proactively engage with instituting better systems to improve aftercare prospects for thoroughbreds. They could be considered the progressives of the industry and they are supported by proactive owners and breeders and other industry participants [97]. They are the supporters, believers in and enablers of technological and biomedical developments. One of the Australian informants reflects this belief in the medical technological intervention to address welfare:

> "The amount of veterinary technological advances year after year after year is just phenomenal. When I used to go to the races years ago, almost every race meeting a horse would break down which is horrendous . . . now with the amount of vet work and the amount of what you can do instantly to fix a horse, you know, the surgical advances, the awareness..."

While some industry informants demonstrate that they consider aspects of the day-to-day care of the thoroughbred, advocacy informants overall demonstrate a more holistic understanding of welfare and quantitatively, devote more of their responses to the need to safeguard the day-to-day well-being of the horse, their species-specific needs, the nature of welfare, and the risks to welfare. Most advocacy informants of this study argue that the current routine practices of husbandry and training compromise welfare. They also demonstrate a richer understanding of sustainability indicators than the industry informants of this study, such as stakeholder engagement, stronger regulation and transparency which they consider indispensable to safeguard thoroughbred welfare. Still, advocacy informants campaign using mostly the most abhorrent practices as a platform to improve thoroughbred protection. They fall short of specifically addressing aspects such as animal agency, telos and animal representation.

There is in principle agreement among the advocacy informants of this study about the role of welfare in safety and integrity, and it is consistent with the views of industry informants. However, it does not have the same relevance for most advocacy informants, as an Australian advocacy informant

stresses, welfare issues that are addressed as part of the safety and integrity remit of the industry concern only a small part of welfare.

4.3.2. Concern for Animal Welfare and Animal Integrity

The *y*-axis of Figure 2 describes "Concern for animal welfare". In the upper half, it is paralleled by increasing "Concern for animal integrity". Industry participants are situated in the lower left and right quadrants of Figure 2, that means at best, they are concerned with some aspects of animal welfare rather than animal integrity. In the reform area of Figure 2, industry informants are concerned with basic health and functioning. Animal welfare-oriented advocates are situated in the reform area between animal welfare and animal integrity. Animal rights-oriented advocates are situated at the highest level in terms of animal protection concern, in the upper left and right quadrants, in the reform area. It appears they are not lobbying for a ban of racing in order to signal willingness to participate in a discourse with the industry, and from that position work toward improving welfare. They lobby for eliminating the most abhorrent practices and presumably then also for addressing day-to-day, husbandry and training issues.

The reform area of Figure 2 accommodates the developments in animal welfare science. The industry informants do not draw on animal welfare science and they do not seem to be familiar with the animal welfare science discourse except in one case, where the industry informant with a background in veterinary science refers to positive and negative animal experiences [60]. They are more concerned with, for example, identifying risk factors for bone fractures and pre-race examination technology. However, animal welfare science plays a significant role in the scholarly sustainability and animal welfare discourse and it can be expected that it will play a larger role in the racing industry some time. Animal welfare science currently integrates three dimensions: Basic health and functioning (especially freedom from disease and injury), affective states (states like pain, distress and pleasure that are experienced as positive or negative) and natural living or *naturalness* (the ability of animals to live reasonably natural lives by carrying out natural behaviour and having natural elements in their environment, and a respect for the *nature* of the animals themselves) [60]. It is fair to assume that individuals within the industry engage with these concepts to care for their horses, predominantly because it is deemed necessary to ensure optimal performance.

To date, there have been no minimal welfare standards in the thoroughbred industry. Even the existence of minimum standards is problematic as practices in the animal agricultural sector show. Animal welfare codes are used to legitimise abhorrent treatments of animals and make them sound normal and in the animal's interest. Haynes [98] reminds us that animal welfare was conceived as an industry-friendly concept that *a priori* does not question the ethics of animal use, and legitimises certain practices based on scientifically presented arguments. As Twine ([29], p. 145) observes, there is an anthropocentric affinity between animal welfare and (mainstream conceptions of) sustainability (see also Section 1).

The reform area of Figure 2 in the lower right quadrant is most likely the area which the industry would consider sustainable in terms of welfare. The preference for techno–bio-medical solutions in that realm is demonstrated with the wish list for future research given by the informant with a veterinarian background, using techno-centred language: The industry needs to do "more to understand the biomechanics of how horses run", to better understand "the impact of our husbandry practices on our asset", track management, biometrics utilising GPS tracking, prohibited substances and emerging technologies such as protein drugs and gene doping, the development of biological passports, the impact of the whip on a horse and whether it affects performance, the causes of EIPH and explore "the appropriate mechanisms for intelligence and its use in relation to effective regulation" to combat drug rings. The increasing development of techno–medical–biological exploration and control of the animal body however is far from addressing animal subjectivities, desires, animal agency or interspecies relationships. Thompson ([51], p. 92) states "a narrowly biological approach even to functional integrity is quite likely to overlook social and cultural dimensions that can cause failure

in livestock systems." With this he refers *inter alia* to the social acceptance of industry practices and trust in the industry. This current author argues that based on the discussion in Sections 1.1 and 2, the ongoing industry focus on concern for industry integrity and the potentially deepening focus on concern for techno–bio-medical solutions is a dead end for thoroughbred protection, in terms of social acceptance as well as in terms of animal integrity, and certainly in terms of interspecies sustainability (as indicated with horizontal lines in Figure 2, on the right of the lower right quadrant).

Based on attitude studies [99] it is assumed that the public is mostly empathising with the horse and is therefore situated in the top left quadrant. The public also emphasises naturalness in terms of behaviour and husbandry [58]. Although self-report studies in the US find people report low levels of knowledge of animal issues, in particular in relation to horses and dogs in racing [100], animal advocacy informants in Australia believe the public has become more knowledgeable about welfare issues overall and with knowledge of welfare issues increasing, expectations for welfare are also increasing. It can be assumed that if members of the public learnt more about common practices in husbandry, breeding, training and racing, and if they understood welfare concepts and issues of telos and animal agency, they would tend to gravitate towards arguing for more consideration of telos.

4.3.3. Interspecies Sustainability

The top right quadrant contains the sphere of "Interspecies Sustainability". Increasing concern for telos (and *telos*+) moves us closer to a state of interspecies sustainability. Aspects of it listed there include animal agency, animal integrity, cultures (including animal knowledge systems), relationality, justice, *naturalness*+ and *ecocentrism*+ (see Section 2). These are key concepts standing in for the broad range of interspecies sustainability descriptors listed in Tables 1–3. Agreeing to focus on the idea of interspecies sustainability and maintaining this focus is already likely to improve animal protection. But, as Vinnari and Vinnari [64] argue, as long as we don't acknowledge that animal protection is a distinct sphere of sustainability, it will not be possible to achieve an ethically and morally justified outcome for animals and for the sustainability transition.

The urgency to address thoroughbred welfare is accepted by the industry informants of this study and many industry participants outside this study. They are also fully aware that "more than ever, horse racing is under the microscope by animal welfare groups, the media, and the public" ([39], p. 9). Administrators and regulators largely have accepted that the concept of social license to operate applies to racing, meaning they accept they require the confidence of the community that racing has the ability to care for horses and successfully self-regulate ([101], p. 318). Yet, their conceptualisations of sustainability are anthropocentric in focus and inward-looking [36].

In contrast to the racing community overall, the informants of this study are in many ways the progressives in the industry and agree with the advocacy informants on many welfare issues and the need to address them, in particular the most egregious welfare violations related to the three main groups of welfare issues, namely the use and potential overuse of drugs and medication, injuries and death on the racetrack, and the aftercare of thoroughbreds exiting the industry [41]. In fact, on certain issues, some or all industry informants express even more progressive views than some advocacy informants at the welfare end of the spectrum. For example, one advocacy informant based in the UK explains that the "real responsibility" of the owner or the trainer is "when the horse finishes the racing career to ensure that that horse is rehomed or at times euthanised". Without exception, all industry informants participating in this study strongly advocate for rehoming of thoroughbreds exiting the industry and euthanasia was not brought up as an option.

The industry informants of this study with all their expressed intentions, seem to fight an uphill battle within their industry. Yet in general, they demonstrate limited inclination to relate to key concepts of interspecies sustainability. Even in terms of the idea of naturalness with its seemingly intuitive connotations of the natural and nature, and its links to the horse world through the horse training technique coined *natural horsemanship* [82,83], seven of the industry informants respond they have not heard of this concept and do not indicate interest in further engaging with this concept. Two

others offer suggestions that naturalness is linked to the horse's natural behaviour and that this is important and should be considered for handling, training and husbandry. One of these two informants remains distant and abstract to the idea of naturalness and its implications, stating in general terms that "understanding natural behaviours is of course very, very relevant to our responsible and ethical use of animals". The second informant relates it to "natural ways of dealing with horses", in terms of husbandry and "in terms of the animal being in its natural state that it's most happy and what it would normally be in without human intervention". She details practical implications of her idea of naturalness demonstrating easy conceptual access to the concept naturalness.

In contrast to most of the industry informants, the advocacy informants are more at ease with the concept of naturalness and take initiative to engage with it. Only one of this group responds he had not heard of it. All others, even though they do not recognise it in its form of "naturalness", they relate to it immediately without further prompting talking about differences in its meaning as related to wild horses or domesticated horses, relating it to natural ways of healing from soreness or injury rather than giving them "medication to keep them running", or in one case, relating it to natural horsemanship. Mostly, they associate with it natural and inherent behavioural needs of horses that need to be catered for and that have important implications to how horses are kept, in particular referring to their social needs as animals who need the direct company of others of their kind. One advocacy informant relates it to handling and training. She emphasises that it is about working with the horses' natural behaviours not against them which "requires a very good understanding of how they think, how they learn, how they respond. And using that knowledge to work together rather than having more of a control-dominance type relationship." This questioning of the hierarchy and dominion is taken up by another advocacy informant who links it to "getting back to more humane and more focused on the horse [approaches] rather than [on] the rider but I still see that as exploitation, or, if not exploitation, certainly utilising the horse's qualities for human benefit".

Importantly, some advocacy informants feel a sense of unease and violation of aspects of interspecies sustainability such as interspecies relationships and biological integrity. For example, one of the Australian advocacy informants describes how she as a student observed

> "some of the handlers were quite rough with [the horses]. You know, they had to be strong and control and dominate them and to me that involved a degree of punishment, using whips and things ... At the time, being a student, it didn't look right to me but then I didn't question because I didn't have a particular knowledge about handling horses and horse behaviour. But ... I didn't feel comfortable."

One of the US-based advocacy informants describes her emotional reaction at the loss of biological integrity of the animal body. She once visited the racehorse Cigar, who during his racing career had been injected with steroids for performance enhancement and this had rendered him infertile. She remembers "feeling just incredibly moved by his whole story" ([41], p. 128).

In sum, the animal advocacy informants of this study demonstrate ways of thinking about and relating to horses that give them access to key concepts of interspecies sustainability such as intra- and interspecies relationships, biological integrity and naturalness. It can be assumed that this applies to other key concepts as well. However, while advocacy informants relate to aspects of interspecies sustainability, they only make limited use of some of them for their advocacy work. But, importantly, they also question the fundamental tenets of animal use, dominion and hierarchy which is not present in the thinking of the industry informants.

The transition to interspecies sustainability needs to be supported by the socio-cultural and political system, including the judiciary, governance, administration and education [102]. Strategies include stakeholder participation and the institution of proxies for animals. Interestingly, despite being able to list a diverse range of stakeholders in thoroughbred welfare, not one participant, neither industry nor advocacy informant, names the thoroughbred as a stakeholder in their own right. When asked who represents the horse, industry informants grapple with the idea of animal representation.

What follows is an example of an exchange between two informants (I1 and I2) and the researcher (R) that demonstrates this disorientation in terms of animal representation:

R: Who do you feel represents the interests of the thoroughbreds in these discussions?

I1: [Sorry?]

R: If you would ask the horse, what would he say who is their advocate?

I2: [laughs slightly].

I1: Hmm.

I2: Good question.

I1: Hmm.

I2: Yeah, I mean, [. . .] the horse's answer would be the trainer.

I1: Right.

I2: Because that's where his grain and hay would be coming from. But looking more at the big picture, ehm, I think it would be a [thoroughbred] national organisation like Thoroughbred Charities of America, Thoroughbred Aftercare Alliance or a network of advocate organisations that are thinking about his retirement, planning for his future. But then certainly, ultimately, it's the owner, because the owner is paying the bills. So I don't know if there is just one person really.

The mandate of both informants in the above exchange within their organisation is weighted toward horse welfare. But the exchange demonstrates that the idea of political animal representation is alien to them as it is to all other industry informants. While they initially try to take the immediate perspective of the horse seeing the trainer feeding him, they ultimately fall back onto the prevalent belief in the ownership model, the horse being a chattel, which they take for granted and not to be questioned. In this model, animal interests are more likely to be seen as less important than human interests, no matter whether, as Francione ([103], p. 9) states, the animal interest at stake is significant and the human interest at stake is relatively trivial.

Another US-based informant states the horse does not need an "ombudsman", because, as other informants also say, everyone represents the horse, from all those who come into contact with the horse including owners, trainers, stable staff, jockeys, to racing authorities. This, however, does not guarantee protection of the interests of the thoroughbred. In fact, the opposite seems to be the case. As Butler et al. ([81], p. 4) consider the realities of the thoroughbred industry at the macrolevel, and thoroughbreds' dependence on the trainer, owner, jockey and stable staff at the microlevel, they suggest thoroughbreds are "subject to asymmetries of power where their genealogy, their working and reproductive life (if they have one) and ultimately their death is dominated by a political ecology of human dominance and exploitation in the same way livestock can be." This perspective is confirmed by many who have researched aspects of the thoroughbred industry [36,104]. Moreover, the majority of the informants of this study make it clear that their concern is weighted towards thoroughbred performance and the economics of the game, rather than the thoroughbred's interests [41].

4.3.4. Identifying Layers of Engagement with Animal Protection

From this study, eight analytical layers of engagement with animal protection are identified. They range from shallower to deeper levels of reflection, from those striving to maintain the status quo (thus necessitating obscuring the real causes of lack of protection), through to reform and to those aiming at transformation. These layers have applicability to the discourse for animal protection in

all animal-using and exploiting industries, and for domestic, wild and liminal animals. The layers, represented under the protection headings used in Figure 2 to which they mostly align, are presented in Table 5 as follows.

Table 5. Layers of engagement with animal protection.

Animal Protection Status	Layers	Description
Status quo/Dominant Welfare Model	Layer 1	Animal protection is focused on functioning for optimal race day performance.
	Layer 2	Animal protection is a by-product of measures taken for industry integrity.
Reform for Welfare/Instrumental Stewardship Model	Layer 3	Animal protection is considered to be equal in importance to racing integrity measures but the focus is on the most egregious welfare violations.
	Layer 4	Under Layer 4, the industry prioritises increased techno–bio-medical manipulation and control and presents these advances as evidence for their caring for welfare. The agricultural sector uses this process to meet the sustainability criterion of efficiency and the economic criterion of optimisation.
	Layer 5	Layer 5 moves animal protection beyond ameliorating death and injuries and the most egregious welfare violations to consider the entire range of issues of the day-to-day living conditions, environmental conditions and, to a limited degree, human–animal interactions. It is, ideally and with good intentions, about a species-relevant and fulfilled life for the animal's entire lifespan.
	Layer 6	This layer is situated within the framework of animal welfare science. For this layer to have any legitimacy, the decisions of which welfare criteria are favoured and the values applied to make that decision need to be transparent.
Transformation/Interspecies Sustainability	Layer 7	Layer 7 engages with all aspects of interspecies sustainability ranging from telos, animal autonomy, individuality, interspecies relationships, interspecies justice, species-innate functional integrity, animal knowledge systems, animal cultures, *naturalness*+, to animals as co-creators of a multispecies world. Industry informants have not demonstrated relevant understanding of these aspects. Some advocacy informants refer to some aspects but have not integrated this intuitive understanding with advocacy strategies and goals.
	Layer 8	Layer 8 is constituted of the social, cultural and political realms and strategies. It is situated to tackle the root causes of animal exploitation and needs to be leveraged to create the conditions for interspecies sustainability. It requires a shift of power, *inter alia* through representation and participation of the animal in governance, administration, regulatory institutions and the judiciary.

The layers identified in the current study can be engaged within a discourse in various combinations concurrently. Layers 1–6 when engaged on their own are based in instrumental rationality, moving toward scientism with Layers 3–6, and all supporting belief in the human right to animal use, with an incremental and reformist approach to improving welfare (Layers 5 and 6), giving priority to resource efficiency (see Section 2.2.1). This improvement of welfare is heavily weighted toward the human use of the animal rather than the animal's telos as discussed by Harfeld [68], or animal culture, knowledge system and self-determination [74]. Layers 1 and 2 largely do not even operate at the lowest common denominator for animal protection. The thoroughbred industry at large engages mostly with layers 1–4, some industry informants of this study demonstrate consideration of Level 5, and one industry informant tentatively of an aspect of Level 6.

Layers 7 and 8 require a fundamental shift in human attitudes, belief systems and paradigms, moving human society away from anthropocentrism, speciesism, dominion, omniscience and omnipotence. The aim is transformation and engagement with animal protection on the animals' own

terms to transition to interspecies sustainability. This process is part of the project of decolonising the animal that has begun in a variety of fields in the social sciences, political sciences, education, ecology and the humanities [105]. However, the dominant scholarly discourse of animal welfare is limited to Layers 1–6, as, for example, in Horseman et al. [106], with their participants' discourse mostly being limited to Layers 1–5.

It is strongly recommended that future research advance frameworks of interspecies sustainability and centre the experience of the thoroughbred. One approach should be engaging with theories of decolonisation [105]. Furthermore, this study has considered one aspect of interspecies sustainability in more detail, namely *naturalness*. Future research should investigate other aspects such as animal autonomy, animal cultures and knowledge systems, and interspecies relationships, what they are and what they would actually look like in practice, and what strategies are needed to translate them into practice. Butler et al. [81] found that human-horse relationships and thoroughbred welfare in the thoroughbred racing industry are deeply affected by the lack of recognition, communication and respect for those working on the ground with the thoroughbreds. Considering that most industry informants of this study suggest that everybody, in particular those on the ground working with the horses, represent the horse in some way or another, this dimension of relationship has particular relevance and urgently needs attention, regardless of whether there are intentions to move toward interspecies sustainability or not. Another important approach would be to apply Coulter's lens of human–animal labour [107] to the thoroughbreds, the workers, and work in the racing and breeding industries. This has particular relevance in light of the need for ecological restructuring of the economy [108] for the sustainability transition, and it has implications for human-animal relations. Finally, research is needed into whether and how traditional forms of animal use can or should be transformed into partnerships that are truly equal and co-created [71–73] and not based on domination for human benefit. Such explorations in research and practice have begun within certain equine cultures, and there is controversy over particular training techniques claiming to be partnership-based [109]. In the longer or shorter term, these explorations can be expected to have implications for the future of riding horses. Finally, there is need for the development of research methodologies in the social sciences that centre the animal while being respectful of the animal and consistent with principles of interspecies sustainability.

5. Conclusions

Interspecies sustainability urgently needs to be advanced to include wildlife, liminal animals, animals labelled "livestock", companion animals and animals used in sport and entertainment or in any other form by humans, so they are not left behind in the sustainability transition. Building on critiques of existing concepts of sustainability, this article provides a theoretical foundation for interspecies sustainability and uses it to conduct original research in three leading thoroughbred racing nations. Interspecies sustainability has been developed as a paradigm to guide human decision-making and actions impacting animals. Aspects of this paradigm include *ecocentrism+*, *telos+*, species-innate functional integrity (*functional integrity+*), interspecies justice, relationality, animal agency, animal cultures and knowledge systems, and a holistic conception of naturalness (*naturalness+*), individuality, adherence to universal rights, a set of inviolable criteria and core values, including transparency and the precautionary principle as important dimensions in governance and decision-making, and to be extended to all species.

There is a deep chasm between the thoroughbred industry and interspecies sustainability. Left to the industry's terms, thoroughbreds will continue to be exposed to unacceptable threats to their welfare and to their lives. At best, existing abhorrent practice may be somewhat curtailed sometime in the future, but the trajectory is set at continued and increasingly refined exploitation. The thoroughbred industry favours measures of techno–bio-medical control to address thoroughbred welfare. In racing as in other animal industries, the protagonist is made to conform and fit into the system. However, most welfare issues and threats to animal protection are not based in the medical, biological or technological realms. They are based in the socio-cultural and political domains and at the level of paradigm.

Ultimately, thoroughbred racing and other animal-using and exploiting industries cannot be reconciled with conditions of interspecies sustainability.

This research highlights eight layers of engagement with animal protection, with only two layers having transformational potential. To advance interspecies sustainability, it is important to identify at which layer the discourse takes place to ensure engagement of those aspects and layers that lead to transformation. The thoroughbred industry engages mostly with four of the eight layers, with the progressives of the industry also calling on Layer 5, none of which advances interspecies sustainability. They are, at best aimed at reform but the industry informants are struggling against forces within the industry itself attempting to maintain the status quo. Some animal advocacy informants express discomfort about linking sustainability, welfare and racing, and overall, they demonstrate a deeper understanding of the interface of sustainability and animal protection. However, there is opportunity for them to leverage it more effectively for animal protection.

This research contributes to conceptual awareness to be able to identify and communicate at what layers a particular discourse in the interface of sustainability and animal protection takes place, to unveil and prevent appropriation of the concepts of sustainability and welfare, and to direct the discourse in a direction that really matters to the animals concerned. The discourse of interspecies sustainability needs to be advanced urgently by animal studies scholars so that the defining of animal welfare and of sustainability is not left to animal-using and -exploiting industries and their supporters.

Supplementary Materials: The following are available online at http://www.mdpi.com/2071-1050/11/19/5539/s1, Figure S1: Coding trees including meaning units, Table S1: Thoroughbred industry informants' definitions of sustainability, Table S2: Animal advocacy informants' definitions of sustainability, Table S3: Essence of the meaning unit "Priorities" (industry informants).

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References

1. Dobson, A. Environment sustainabilities: An analysis and a typology. *Environ. Politics* **1996**, *5*, 401–428. [CrossRef]
2. Selby, D. The firm and shaky ground of education for sustainable development. In *Green Frontiers-Environmental Educators Dancing Away from Mechanism*; Transgressions: Cultural Studies and Education; Gray-Donald, J., Selby, D., Eds.; Sense Publishers: Rotterdam, The Netherlands, 2008; pp. 59–75.
3. Sachs, W. Global Ecology and the shadow of "Development". In *Deep Ecology for the Twenty-First Century: Readings on the Philosophy and Practice of the New Environmentalism*; Sessions, G., Ed.; Shambhala: Boston, UK, 1995; pp. 428–444.
4. Washington, H. *Demystifying Sustainability: Towards Real Solutions*; Routledge: Abingdon, UK, 2015.
5. Silas, C.J. The environment: Playing to win. *Public Relat. J.* **1990**, *46*, 33–35.
6. Boscardin, L. Greenwashing the animal-industrial complex: Sustainable intensification and the Livestock Revolution. In *Contested Sustainability Discourses in the Agrifood System*; Constance, D.H., Konefal, J.T., Hatanaka, M., Eds.; Routledge: Abingdon, UK, 2018; pp. 111–126.
7. WCED. *Our Common Future*; Oxford University Press: Oxford, UK, 1987.

8. Von Keyserlingk, M.A.G.; Martin, N.P.; Kebreab, E.; Knowlton, K.F.; Grant, R.J.; Stephenson, M.; Sniffen, C.J.; Harner, J.P.; Wright, A.D.; Smith, S.I. Invited review: Sustainability of the US dairy industry. *J. Dairy Sci.* **2013**, *96*, 5405–5425. [CrossRef]
9. Steinfeld, H.; Gerber, P.; Wassenaar, T.; Castel, V.; Rosales, M.; de Haan, C. *Livestock's Long Shadow*; Food and Agriculture Organization of the United Nations: Rome, Italy, 2006.
10. Westhoek, H.; Lesschen, J.P.; Rood, T.; Wagner, S.; De Marco, A.; Murphy-Bokern, D.; Leip, A.; van Grinsven, H.; Sutton, M.A.; Oenema, O. Food choices, health and environment: Effects of cutting Europe's meat and dairy intake. *Glob. Environ. Chang.* **2014**, *26*, 196–205. [CrossRef]
11. Campbell, B.; Beare, D.; Bennett, E.; Hall-Spencer, J.; Ingram, J.; Jaramillo, F.; Ortiz, R.; Ramankutty, N.; Sayer, J.; Shindell, D. Agriculture production as a major driver of the Earth system exceeding planetary boundaries. *Ecol. Soc.* **2017**, *22*. [CrossRef]
12. Barnosky, A.D.; Brown, J.H.; Daily, G.C.; Dirzo, R.; Ehrlich, A.H.; Ehrlich, P.R.; Eronen, J.T.; Fortelius, M.; Hadly, E.A.; Leopold, E.B.; et al. Introducing the Scientific Consensus on Maintaining Humanity's Life Support Systems in the 21st Century: Information for Policy Makers. *Anthr. Rev.* **2014**, *1*, 78–109.
13. Boscardin, L.; Bossert, L. Sustainable Development and Nonhuman Animals: Why Anthropocentric Concepts of Sustainability Are Outdated and Need to Be Extended. In *Ethics of Science in the Research for Sustainable Development*; Meisch, S., Lundershausen, J., Bossert, L., Rockoff, M., Eds.; Nomos: Baden-Baden, Germany, 2015; Volume 1, pp. 323–352.
14. IPBES. *Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*; IPBES Secretariat: Bonn, Germany, 2019.
15. Kopnina, H. Forsaking Nature? Contesting 'Biodiversity' Through Competing Discourses of Sustainability. *J. Educ. Sustain. Dev.* **2013**, *7*, 51–63. [CrossRef]
16. Kopnina, H. The victims of unsustainability: A challenge to sustainable development goals. *Int. J. Sustain. Dev. World Ecol.* **2016**, *23*, 113–121. [CrossRef]
17. Weis, T. The meat of the global food crisis. *J. Peasant Stud.* **2013**, *40*, 65–85. [CrossRef]
18. FAOSTAT. Available online: http://www.fao.org/faostat/en/#data/QL (accessed on 19 July 2019).
19. Shields, S.; Orme-Evans, G. The Impacts of Climate Change Mitigation Strategies on Animal Welfare. *Animals* **2015**, *5*, 361–394. [CrossRef]
20. Wadiwel, D.J. *The War Against Animals*; Critical Animal Studies; Rodopi: Leiden, The Netherlands, 2015; Volume 3.
21. Rawles, K. Sustainable Development and Animal Welfare: The Neglected Dimension. In *Animals, Ethics, and Trade: The Challenge of Animal Sentience*; Turner, J., D'Silva, J., Eds.; MPG Books Limited: Bodmin, UK, 2006; pp. 208–216.
22. Rockström, J.; Williams, J.; Daily, G.; Noble, A.; Matthews, N.; Gordon, L.; Wetterstrand, H.; DeClerck, F.; Shah, M.; Steduto, P.; et al. Sustainable intensification of agriculture for human prosperity and global sustainability. *Ambio* **2017**, *46*, 4–17. [CrossRef]
23. Deckers, J. *Animal (De)liberation: Should the Consumption of Animal Products Be Banned?* Ubiquity Press: London, UK, 2016.
24. Gunderson, R. From Cattle to Capital: Exchange Value, Animal Commodification, and Barbarism. *Crit. Sociol.* **2011**, *39*, 259–275. [CrossRef]
25. Nordquist, R.E.; van der Staay, F.J.; van Eerdenburg, F.J.C.M.; Velkers, F.C.; Fijn, L.; Arndt, S.S. Mutilating Procedures, Management Practices, and Housing Conditions That May Affect the Welfare of Farm Animals: Implications for Welfare Research. *Animals* **2017**, *7*, 12. [CrossRef]
26. Oltenacu, P.; Broom, D. The impact of genetic selection for increased milk yield on the welfare of dairy cows. *Anim. Welf.* **2010**, *19*, 39–49.
27. Rauw, W.M.; Kanis, E.; Noordhuizen-Stassen, E.N.; Grommers, F.J. Undesirable side effects of selection for high production efficiency in farm animals: A review. *Livest. Prod. Sci.* **1998**, *56*, 15–33. [CrossRef]
28. Wicks, D. Demystifying Dairy. *Anim. Stud. J.* **2018**, *7*, 5.
29. Twine, R. *Animals as Biotechnology: Ethics, Sustainability and Critical Animal Studies*; Earthscan: London, UK, 2010.
30. Thompson, P.B. Why using genetics to address welfare may not be a good idea. *Poult. Sci.* **2010**, *89*, 814–821. [CrossRef]

31. Arcari, P. Normalised, human-centric discourses of meat and animals in climate change, sustainability and food security literature. *Agric. Hum. Values* **2017**, *34*, 69–86. [CrossRef]
32. Twine, R. Revealing the "animal-industrial complex": A concept and method for critical animal studies? *J. Crit. Anim. Stud.* **2012**, *10*, 12–39.
33. MacNeill, J. The forgotten imperative of sustainable development. *Environ. Policy Law* **2006**, *36*, 167–170.
34. Gruenewald, D.A. A Foucauldian Analysis of Environmental Education: Toward the Socioecological Challenge of the Earth Charter. *Curric. Inq.* **2004**, *34*, 71–107. [CrossRef]
35. IFHA Members. Available online: https://www.ifhaonline.org/Default.asp?section=About%20IFHA&area=5 (accessed on 1 August 2019).
36. McManus, P.; Albrecht, G.; Graham, R. *The Global Horseracing Industry: Social, Economic, Environmental and Ethical Perspectives*; Routledge: Abingdon, UK, 2013.
37. Pope, L. *Some Touch of Pity*; Sid Harta Publishers: Glen Waverly, Australia, 2014.
38. Singer, D.; Lamb, M. Driving sustainable growth for Thoroughbred racing and breeding. In *Proceedings of the Driving Sustainable Growth for Thoroughbred Racing and Breeding: Findings and Recommendations*; Gideon Putnam Resort; The Jockey Club: Saratoga Springs, NY, USA, 14 August 2011.
39. The Jockey Club. *Vision 2025: To Prosper, Horse Racing Needs Comprehensive Reform*; The Jockey Club: New York, NY, USA, 2019.
40. Cherwa, J. Horse Racing Industry Fights for Survival in Wake of Deaths and Scrutiny. *Los Angeles Times*. 2 May 2019. Available online: https://www.latimes.com/sports/more/la-sp-california-horse-racing-survival-20190502-story.html (accessed on 16 July 2019).
41. Bergmann, I. He Loves to Race—Or does He? Ethics and Welfare in Racing. In *Equine Cultures in Transition: Ethical Questions*; Bornemark, J., Andersson, P., Ekström von Essen, U., Eds.; Routledge Advances in Sociology; Routledge: Abingdon, UK, 2019; pp. 117–133.
42. Davison, A. *Technology and the Contested Meanings of Sustainability*; State University of New York Press: Albany, NY, USA, 2001.
43. Hector, D.C.; Christensen, C.B.; Petrie, J. Sustainability and Sustainable Development: Philosophical Distinctions and Practical Implications. *Environ. Values* **2014**, *23*, 7–28. [CrossRef]
44. Sterling, S. Whole Systems Thinking as a Basis for Paradigm Change in Education: Explorations in the Context of Sustainability. Ph.D. Thesis, University of Bath, Bath, UK, 2003.
45. Ziegler, R.; Ott, K. The quality of sustainability science: A philosophical perspective. *Sustain. Sci. Pract. Policy* **2011**, *7*, 31–44. [CrossRef]
46. Washington, H.; Taylor, B.; Kopnina, H.N.; Cryer, P.; Piccolo, J.J. Why ecocentrism is the key pathway to sustainability. *Ecol. Citiz.* **2017**, *1*, 35–41.
47. Costanza, R.; Alperovitz, G.; Daly, H.; Farley, J.; Franco, C.; Jackson, T.; Kubiszewski, I.; Schor, J.; Victor, P. Building a Sustainable and Desirable Economy-in-Society-in-Nature. In *State of the World 2013: Is Sustainability Still Possible?* Starke, L., Ed.; Island Press: Washington, DC, USA, 2013; pp. 126–142.
48. Earth Charter Commission. *The Earth Charter*; Earth Charter International: San Jose, Costa Rica, 2000.
49. Díaz, S.; Demissew, S.; Carabias, J.; Joly, C.; Lonsdale, M.; Ash, N.; Larigauderie, A.; Adhikari, J.R.; Arico, S.; Báldi, A.; et al. The IPBES Conceptual Framework—Connecting nature and people. *Curr. Opin. Environ. Sustain.* **2015**, *14*, 1–16. [CrossRef]
50. Mikkelson, G.M. Holistic versus individualistic non-anthropocentrism. *Ecol. Citiz.* **2019**, *2*, 137–138.
51. Thompson, P.B. Sustainability as a norm. *Techné: Technol. Cult. Concept* **1997**, *2*, 75–94. [CrossRef]
52. Thompson, P.B.; Nardone, A. Sustainable livestock production: Methodological and ethical challenges. *Livest. Prod. Sci.* **1999**, *61*, 111–119. [CrossRef]
53. Thompson, P.B. *The Agrarian Vision: Sustainability and Environmental Ethics*; University Press of Kentucky: Lexington, KY, USA, 2010.
54. Boogaard, B.K.; Oosting, S.J.; Bock, B.B. Defining sustainability as a socio-cultural concept: Citizen panels visiting dairy farms in the Netherlands. *Livest. Sci.* **2008**, *117*, 24–33. [CrossRef]
55. Calker, K.J.V.; Berentsen, P.B.M.; Giesen, G.W.J.; Huirne, R.B.M. Identifying and ranking attributes that determine sustainability in Dutch dairy farming. *Agric. Hum. Values* **2005**, *22*, 53–63. [CrossRef]
56. Buller, H.; Roe, E. Commodifying animal welfare. *Anim. Welf.* **2012**, *21*, 131–135. [CrossRef]
57. Buller, H.; Roe, E. Modifying and commodifying farm animal welfare: The economisation of layer chickens. *J. Rural Stud.* **2014**, *33*, 141–149. [CrossRef]

58. Clark, B.; Stewart, G.B.; Panzone, L.A.; Kyriazakis, I.; Frewer, L.J. A Systematic Review of Public Attitudes, Perceptions and Behaviours Towards Production Diseases Associated with Farm Animal Welfare. *J. Agric. Environ. Ethics* **2016**, *29*, 455–478. [CrossRef]
59. Yeates, J. Naturalness and Animal Welfare. *Animals* **2018**, *8*, 53. [CrossRef]
60. Fraser, D. Understanding animal welfare. *Acta Vet. Scand.* **2008**, *50*, 1–7. [CrossRef]
61. Earnshaw, G.I. Equity as a Paradigm for Sustainability: Evolving the Process toward Interspecies Equity. *Anim. L* **1999**, *5*, 113–146.
62. Probyn-Rapsey, F.; Donaldson, S.; Iiannides, G.; Lea, T.; Marsh, K.; Neimanis, A.; Potts, A.; Taylor, N.; Twine, R.; Wadiwel, D.; et al. A Sustainable Campus: The Sydney Declaration on Interspecies Sustainability. *Anim. Stud. J.* **2016**, *5*, 110–151.
63. Narayanan, Y. Where are the Animals in Sustainable Development? Religion and the Case for Ethical Stewardship in Animal Husbandry: Animals in Sustainable Development. *Sustain. Dev.* **2016**, *24*, 172–180. [CrossRef]
64. Vinnari, M.; Vinnari, E. A Framework for Sustainability Transition: The Case of Plant-Based Diets. *J. Agric. Environ. Ethics* **2014**, *27*, 369–396. [CrossRef]
65. Vinnari, M.; Vinnari, E.; Kupsala, S. Sustainability Matrix: Interest Groups and Ethical Theories as the Basis of Decision-Making. *J. Agric. Environ. Ethics* **2017**, *30*, 349–366. [CrossRef]
66. Buller, H.; Blokhuis, H.; Jensen, P.; Keeling, L. Towards Farm Animal Welfare and Sustainability. *Animals* **2018**, *8*, 81. [CrossRef]
67. Buller, H.; Morris, C. Beasts of a different burden: Agricultural sustainability and farm animals. In *Sustainable Farmland Management: Transdisciplinary Approaches*; Fish, R., Seymour, S., Steven, M., Watkins, C., Eds.; CABI: Wallingford, UK; Cambridge, MA, USA, 2008; pp. 135–148.
68. Harfeld, J.L. Telos and the Ethics of Animal Farming. *J. Agric. Environ. Ethics* **2013**, *26*, 691–709. [CrossRef]
69. Palmer, C. 'Respect for nature' in the earth charter: The value of species and the value of individuals. *Ethicsplace Environ.* **2004**, *7*, 97–107. [CrossRef]
70. Bekoff, M. Compassionate Conservation and the Ethics of Species Research and Preservation: Hamsters, Black-Footed Ferrets, and a Response to Rob Irvine. *Bioethical Inq.* **2013**, *10*, 527–529. [CrossRef]
71. Cudworth, E. Ecofeminism and the animal. In *Contemporary Perspectives on Ecofeminism*; Phillips, M., Rumens, N., Eds.; Routledge Explorations in Environmental Studies; Routledge: Abingdon, UK, 2016; pp. 38–56.
72. Plumwood, V. *Environmental Culture: The Ecological Crisis of Reason*; Routledge: London, UK, 2005.
73. Plumwood, V. *Feminism and the Mastery of Nature*; Routledge: London, UK, 1993.
74. Garlick, S.; Austen, R. Learning about the emotional lives of kangaroos, cognitive justice and environmental sustainability. *Relations. Beyond Anthr.* **2014**, *2*, 33–48. [CrossRef]
75. Cochrane, A. *Sentientist Politics: A Theory of Global Inter-Species Justice*; Oxford University Press: New York, NY, USA, 2018.
76. Donaldson, S.; Kymlicka, W. *Zoopolis: A Political Theory of Animal Rights*; Oxford University Press: New York, NY, USA, 2011.
77. Gray, J.; Curry, P. Ecodemocracy: Helping wildlife's right to survive. *ECOS* **2016**, *37*, 18–27.
78. IFHA. *International Agreement on Breeding, Racing and Wagering*; International Federation of Horseracing Authorities: Boulogne, France, 2019; Available online: https://ifhaonline.org/default.asp?section=IABRW&area=15 (accessed on 19 September 2019).
79. IFHA. Boulogne, France. Available online: http://www.ifhaonline.org/ (accessed on 16 July 2019).
80. Butler, D.; Valenchon, M.; Annan, R.; Whay, H.; Mullan, S. Living the 'Best Life' or 'One Size Fits All'—Stakeholder Perceptions of Racehorse Welfare. *Animals* **2019**, *9*, 134. [CrossRef]
81. Butler, D.; Valenchon, M.; Annan, R.; Whay, H.R.; Mullan, S. Stakeholder Perceptions of the Challenges to Racehorse Welfare. *Animals* **2019**, *9*, 363. [CrossRef]
82. Birke, L. "Learning to Speak Horse": The Culture of "Natural Horsemanship". *Soc. Anim.* **2007**, *15*, 217–239. [CrossRef]
83. Patton, P. Power, ethics and animal rights. In *Equine Cultures in Transition: Ethical Questions*; Bornemark, J., Andersson, P., Ekström von Essen, U., Eds.; Routledge Advances in Sociology; Routledge: Abingdon, UK, 2019; pp. 84–96.
84. Bryman, A. *Social Research Methods*, 4th ed.; Oxford University Press: Oxford, UK, 2012.

85. Bengtsson, M. How to plan and perform a qualitative study using content analysis. *Nurs. Open* **2016**, *2*, 8–14. [CrossRef]
86. Thomson, P.; Hayek, A.; Jones, B.; Evans, D.; McGreevy, P. Number, causes and destinations of horses leaving the Australian Thoroughbred and Standardbred racing industries. *Aust. Vet. J.* **2014**, *92*, 303–311. [CrossRef]
87. Graham, R.; McManus, P. Changing Human-Animal Relationships in Sport: An Analysis of the UK and Australian Horse Racing Whips Debates. *Animals* **2016**, *6*, 32. [CrossRef]
88. Silvester, J. Do Crooks Fancy Horse Racing? You Can Bet on it! *The Age*. 18 August 2012. Available online: https://www.theage.com.au/national/victoria/do-crooks-fancy-horse-racing-you-can-bet-on-it-20120817-24dym.html (accessed on 17 July 2019).
89. AAEP. *Clinical Guidelines for Veterinarians Practicing in a Pari-Mutuel Environment*; American Association of Equine Practitioners: Lexington, KY, USA, 2010; Available online: https://aaep.org/newsroom/whitepapers (accessed on 25 September 2019).
90. RCVS Berkshire Equine Vet Struck off for Dishonesty and Breaching Racing Rules. Royal College of Veterinary Surgeons. *Professionals*. 23 February 2011. Available online: https://www.rcvs.org.uk/news-and-views/news/berkshire-equine-vet-struck-off-for-dishonesty-and-breaching-rac/ (accessed on 27 September 2019).
91. Anon. Danny O'Brien and Mark Kavanagh Cleared of Administering Cobalt by Court of Appeal. *The Sydney Morning Herald*. 17 November 2017. Available online: https://www.smh.com.au/sport/racing/victorian-trainers-partly-win-appeal-on-cobalt-charges-20171117-gzn887.html (accessed on 27 September 2019).
92. Crispe, E.J.; Lester, G.D. Exercise-induced Pulmonary Hemorrhage: Is It Important and Can It Be Prevented? *Vet. Clin. Equine Pract.* **2019**, *35*, 339–350. [CrossRef]
93. Ross, D. Lasix: The Drug Debate Which is Bleeding US Horse Racing Dry. *The Guardian*. 31 August 2014. Available online: http://www.theguardian.com/sport/2014/aug/31/lasix-drug-debate-bleeding-horse-racing (accessed on 28 July 2015).
94. AAEP. Position on Therapeutic Medications in Racehorses. Available online: https://aaep.org/position-therapeutic-medications-racehorses (accessed on 23 September 2019).
95. Meyer, H. Divergierende Interessen und Konflikte beim tierärztlichen Einsatz für die sportliche Leistungsfähigkeit des Pferdes einerseits und für dessen langfristiges Wohlergehen andererseits. *Pferdeheilkunde (Equine Med.)* **2009**, *25*, 354–366. [CrossRef]
96. Blea, J.A. Ethical issues for the racetrack practitioner. In Proceedings of the 58th Annual Convention of the American Association of Equine Practitioners—AAEP, Anaheim, CA, USA, 1–5 December 2012; American Association of Equine Practitioners: Lexington, KY, USA, 2012; Volume 58.
97. Water Hay Oats Alliance. Available online: http://www.waterhayoatsalliance.com/ (accessed on 26 September 2019).
98. Haynes, R.P. Competing Conceptions of Animal Welfare and Their Ethical Implications for the Treatment of Non-Human Animals. *Acta Biotheor.* **2011**, *59*, 105–120. [CrossRef]
99. Futureye. *Commodity or Sentient Being-Australia's Shifting Mindset on Farm Animal Welfare*; Futureye: Windsor, Australia, 2019.
100. Faunalytics Animal Tracker 2019: Methods & Overview. Available online: https://faunalytics.org/animal-tracker-2019-methods-overview/ (accessed on 16 July 2019).
101. Duncan, E.; Graham, R.; McManus, P. 'No one has even seen . . . smelt . . . or sensed a social licence': Animal geographies and social licence to operate. *Geoforum* **2018**, *96*, 318–327. [CrossRef]
102. James, P. *Urban Sustainability in Theory and Practice: Circles of Sustainability*; Taylor & Francis: London, UK, 2015.
103. Francione, G.L. Reflections on "Animals, Property, and the Law" and "Rain without Thunder". *Law Contemp. Probl.* **2007**, *70*, 9–57.
104. Winter, C.; Young, W. Fatalities and Fascinators: A New Perspective on Thoroughbred Racing. In *Domestic Animals and Leisure*; Carr, N., Ed.; Palgrave Macmillan: Basingstoke, UK, 2015; pp. 241–258.
105. Australasian Animal Studies Association Decolonizing Animals—Book of Abstracts. In Proceedings of the Decolonizing Animals 2019 Conference, Hosted by the New Zealand Centre for Human-Animal Studies/Te Puna Akoranga o Aotearoa mō te Tangata me te Kararehe. The Piano, Ōtautahi (Christchurch), New Zealand, 1–4 July 2019; Available online: https://aasa2019.org/ (accessed on 16 July 2019).
106. Horseman, S.V.; Buller, H.; Mullan, S.; Knowles, T.G.; Barr, A.R.S.; Whay, H.R. Equine Welfare in England and Wales: Exploration of Stakeholders' Understanding. *J. Appl. Anim. Welf. Sci.* **2017**, *20*, 9–23. [CrossRef]

107. Coulter, K. *Animals, Work, and the Promise of Interspecies Solidarity*; Palgrave Macmillan: Basingstoke, UK, 2016.
108. Bauhardt, C. Solutions to the crisis? The Green New Deal, Degrowth, and the Solidarity Economy: Alternatives to the capitalist growth economy from an ecofeminist economics perspective. *Ecol. Econ.* **2014**, *102*, 60–68. [CrossRef]
109. Bornemark, J.; Andersson, P.; Ekström von Essen, U. Equine Cultures in Transition: Ethical Questions. In *Routledge Advances in Sociology*, 1st ed.; Routledge: Abingdon, UK, 2019; Volume 1.

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