

What Is Understood About the Welfare of Horses Working in Australian Cattle Feedlots: An Introductory Survey

Karly Liffen^{1,2,*}, Cathrynne Henshall², and Hayley Randle²

¹Department of Applied Animal Science and Welfare, Swedish University of Agricultural Sciences, Umeå, 901 83, Sweden

²School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, 2678, NSW, Australia

* Author to whom any correspondence should be addressed; Email: karly.liffen@slu.se

Received: 19 January 2026; Revised: 22 March 2026; Accepted: 14 April 2026; Published: 07 May 2026



Academic Editor: Lorna Cameron, Hartpury University, United Kingdom

Abstract

Ridden horses are commonly used to manage cattle in feedlots in a range of countries, including Australia. While there is public concern about the welfare of cattle in feedlots, research into feedlot working horses and their welfare is lacking to date. Accordingly, an online survey was initially developed to ascertain the views of Australian animal and equine communities concerning this cohort of horses and the work they perform. In addition, respondents were asked about their views on animal welfare in general. The survey comprised a mixture of Likert scale questions consisting of six options, multiple-choice responses, and open-ended responses, and was completed by a total of 440 participants. The majority of participants were involved in the equine industry (95.87%), and therefore the findings reflect an equine industry viewpoint. Animal welfare in general was considered to be at a minimum important ($\chi^2 = 20.1$, $df = 5$, $P = 0.001$), and animal well-being was considered extremely important ($\chi^2 = 10.59$, $df = 4$, $P = 0.032$). Animal agency was considered important or very important by a majority (354) of participants ($\chi^2 = 10.6$, $df = 5$, $P = 0.06$). Participants strongly agreed that cattle welfare has the potential to be improved by the use of horses on feedlots ($\chi^2 = 6.17$, $df = 2$, $P = 0.046$). Participants clearly believe that animal and horse welfare is important both generally and in the feedlot industry. This aligns with wider community concerns about the welfare of animals used for, and in association with, food production.

Keywords

Working horse; management; well-being; industry perception; agency

1. Introduction

There is ongoing community concern about the treatment of animals used for food production, including the welfare of cattle housed in feedlots [1]. However, what is less commonly known is that horses are widely used to manage cattle in feedlots in many countries, including the United States of America and Australia. In feedlot work, horses are used by 'pen riders' to assist with the monitoring and assessment of cattle health/welfare, as well as to move cattle around the feedlot. The working conditions of these horses may include long periods of ridden work spanning a full day in varying weather conditions such as heat, rain, and cold, with minimal access to rest or feed during work. In comparison

to other types of working horses such as police [2], riding school [3], equine-assisted therapy [4], ranch [5], carriage [6], and tourism [7] horses, there are no scientific data on the working lives or welfare of feedlot horses or the impact of the horses on cattle welfare. These horses are also subject to higher workloads compared to most other horses [8]. When not working, feedlot horse time budgets mimic those of semi-feral horses over a 24-hour period [8]. Since feedlot working horses often spend more time working and less time being able to perform natural behaviors, the investigation of their welfare during both working and rest periods is of major importance, as only with increased knowledge can their welfare be assessed/managed, and if necessary,

improved. This knowledge is also fundamental in maintaining a social license to operate for working horses in general, as community opinion may disapprove of the use of working horses with limited agency if their welfare is not provided for and information is not readily and publicly available.

In the Australian feedlot industry, horses used for feedlot work are generally owned by their rider (feedlot employee) rather than the feedlot and are considered an essential tool in the work of managing feedlot cattle. In addition, the use of horses in this system means that the wider equine industry can be viewed as a stakeholder in the feedlot industry. This horse-human working relationship, where not only are the horses ridden by humans for work, but they are also owned by them, poses some distinct barriers to welfare, such as individual horse welfare being in competition with the needs of the rider/owner and industry [9,10]. Not only does this horse-human working relationship give rise to questions about how this relationship affects equine welfare, but it may also mean that the equine industry is held by the general public to a higher standard, as more often than not, having horses is seen as a luxury and not a necessity, and horses are often viewed in a similar light to companion species (e.g., dogs) rather than as production animals [11].

The welfare of working horses around the world is the subject of increasing scrutiny [7,12], and it is likely that Australian working horses will, at some stage, also be subject to this scrutiny in common with other Australian livestock industries, such as the Australian dairy industry and the Australian live export industry [13]. This scrutiny will likely be due to two factors: first, the role of a working horse in an already scrutinized livestock production industry and second, the general public's scrutiny of the Australian equine industry as a whole, as already evident in the pressures on public-facing sectors such as racing [13–15].

These public concerns about topics such as animal welfare can lead to pressure on an industry's social license to operate (SLO). The SLO refers to the social or public acceptance of an industry, despite the harms it may cause to the environment, people, or animals, because overall, the industry is believed to benefit society as a whole [14]. Public approval for these types of activities can only be maintained if the particular industry is considered legitimate, consent from industry and community stakeholders is gained, and there is trust between the industry and the wider community in which it operates [16]. Public acceptance is supported by the application and presentation of scientific research that addresses the gaps in industry, but also the perceived gaps that come to light when SLO is addressed [17].

In the case of the use of animals for food production, protection of the welfare of those animals is critical in the maintenance of SLO, and there is extensive literature on the welfare of production animals, including feedlot cattle [1]. Important in the protection of production animals is the assessment of welfare, which has undergone considerable development, from the Five Freedoms [18] to the Five Domains Model [10], which, unlike the former, flexibly incorporates ongoing developments in modern animal welfare science, including animal behavior, animal affective state, and individual animal mental well-being. The Five Domains Model provides a comprehensive, animal-focused framework for

animal welfare assessment. However, as is common in the interaction between welfare assessment and the practicalities of animal production systems, how assessment findings are implemented may not align with current science or community expectations [19]. This tension is likely to be evidenced in the case of feedlot horses on whose work their riders rely to earn an income, but whose working conditions and the operational characteristics of the feedlot environment may not align with or enable changes to improve their welfare. Gaps between best practices, informed by science, and the realities of industry practices may undermine the feedlot and associated equine industries' SLO [13].

The feedlot industry's SLO is not solely based on evidence generated by scientific enquiry but also encompasses the ethical and moral concerns a community may hold [11]. Within the community, the concerns that individual stakeholder groups (e.g., animal and equine communities) may hold about the feedlot industry and the use of horses in that industry, as well as the importance they attach to the various welfare domains, are a valuable subject for research. This is due to the fact that these stakeholder groups may hold either specialized knowledge about the industry or, as a result of their being directly involved in the industry as horse owners, for example, their views may in fact diverge from the general public, as identified in a range of recent public surveys [20,21]. Understanding how welfare and well-being are understood by this cohort of industry stakeholders is crucial due to the lack of definitions and often negative connotations the word welfare holds [22]. This increased understanding will help facilitate future research and welfare improvements that address industry concerns, public concerns, and knowledge gaps [23]. As such, an online survey was initially developed to identify industry stakeholders' (animal and equine community members) understanding/knowledge of animal welfare and the role of horses in Australian cattle feedlots.

2. Material and Methods

An online survey was constructed to gauge industry perceptions about the understanding of animal welfare, equine welfare in general, and the welfare of horses working in feedlots in particular. While the initial survey was aimed at the broader community and industries, after analysis, the focus was changed to the equine community due to the participant industry demographics. The survey was designed with questions specifically relating to feedlot working horses. It also asked participants to rate their general opinion of animal welfare-based words, where these words were based on the Five Domains Model framework [10], but by design the framework was not mentioned to participants.

The survey was created using Survey Monkey (Survey Monkey®, San Mateo, CA, USA) with five iterations. The final version was released after pilot testing with five experienced industry participants. It comprised a mixture of 20 open and closed questions, where skip logic was used to ensure only relevant questions were asked. Participants were recruited via Facebook® and internal university email distribution lists aimed at the School of Agricultural, Environmental and Veterinary Sciences (Charles Sturt University) employees (including academics, professional/technical staff, and students), as they were thought to be representative of the

animal and equine industry/community. The survey was also distributed by individuals through online platforms (e.g., Facebook®).

The term animal community refers broadly to anyone involved with animals, encompassing all individuals and groups, including those engaged with livestock, companion animals, and other species. This includes, but is not limited to, stakeholders such as animal owners, caretakers, industry professionals, policymakers, and welfare advocates. The term equine community broadly refers to anyone involved with horses, whether on an individual or group level. This includes, but is not limited to, stakeholders such as horse owners, caretakers, industry professionals, policymakers, and welfare advocates. To be eligible, participants had to be an Australian permanent resident or citizen over the age of 18 years. The survey was available between August 2021 and December 2021.

The survey comprised a mixture of Likert scale questions consisting of six options: 1. Not at all important, 2. Somewhat important, 3. Important, 4. Very important, 5. Extremely important, and 6. Don't know/unsure; multiple-choice responses for demographic information where participants could choose from predefined response categories with a selected number of options (such as age range or gender), and open-ended responses where participants could provide free-text answers with no restrictions (see **Supplementary Materials**).

2.1. Data Analysis

Survey data were downloaded from Survey Monkey (Survey Monkey®, San Mateo, CA, USA) and imported into Microsoft Excel (Microsoft Office 365). Once imported into Excel, these were saved as a CSV file and imported into JASP STATS 0.15 Version (Amsterdam, Netherlands). Descriptive data analysis was conducted to determine frequencies and percentages of participant demographic data before conducting a series of Chi-squared tests of association (goodness of fit) to investigate the significance of relationships between quantitative responses. Analyses were performed in relation to participant roles in the equine industry (whether they were involved in the industry or not) and their understanding and perception of animal/equine/feedlot working horses' welfare. A probability of $P < 0.05$ was used for significance. Qualitative content provided in open-text responses was manually collated into an Excel spreadsheet in preparation for analysis. Thematic analysis of the free-text responses to open questions was conducted using tags (open codes) to create topics (focused codes), resulting in a number of emerging themes [24].

3. Results

The online survey was completed by 492 participants. Of these, 17 were not over the age of 18 years, two did not reside in Australia, and one participant met both exclusion criteria, so these participants were excluded, resulting in 472 usable surveys. Of these participants, 440 (93.2%) completed the survey fully; however, $n = 52$ did not answer all the questions, with questions being skipped randomly. This resulted in differing numbers of people answering all survey questions, but due to the exploratory nature of the study, all answers were retained. As 492 participants began the survey, there was a

margin of error of $\pm 4\%$ at a 95% confidence interval, based on an estimated Australian equine industry community of 400,000 horse owners [1]. Most survey participants were female ($n = 410$), with a wide range of ages represented: 18–25 years ($n = 128$), 26–33 ($n = 94$), 34–41 ($n = 67$), 42–49 ($n = 52$), 50–57 ($n = 54$), 58–65 ($n = 34$), and over 65 ($n = 11$). Inspection of postcodes provided by 433 participants showed that 282 out of 3333 Australian postcodes were represented, with a prevalence ($n = 51$; 11.8%) in the rural city of Wagga Wagga, Australia (2650), and its surrounding suburbs. Classification of survey participants according to their involvement in the equine industry, that is, whether they worked in the equine industry, just owned horses, or were involved with horses in another capacity, revealed that 95.87% of participants were involved with horses in some form ($n = 418/436$). Just under half of participants (46.5%; $n = 200/430$) worked in the animal production and livestock industry. Only 22.14% ($n = 93/327$) of participants reported having specifically worked in an animal feedlot setting (not restricted to cattle, i.e., sheep). Only 4.2% ($n = 20/472$) of survey participants were not involved in the equine industry, and therefore these responses were excluded from further analysis.

3.1. Equine Industry Participant Perception of Animal Welfare

The majority of participants ($n = 376/379$) who were involved in the equine industry considered animal welfare to be at a minimum important ($\chi^2 = 20.1$, $df = 5$, $P = 0.001$; 373/376), with only 3/379 being unsure or seeing it as not important. The consensus from participants was that animal welfare was at a minimum important ($n = 21$), with the majority ($n = 51$) believing it was either very important or extremely important ($n = 296$).

Animal well-being was regarded as extremely important ($\chi^2 = 10.59$, $df = 4$, $P = 0.032$; 294/378), with none of the participants being unsure if well-being was regarded as important or not important. Animal emotion was seen as either being very important or extremely important ($\chi^2 = 14.59$, $df = 5$, $P = 0.012$; 280/378). Similarly, participants identified animal mental health as very important or extremely important ($\chi^2 = 20.00$, $df = 5$, $P = 0.001$; 311/379).

While there was acknowledgment of the importance of an animal's ability to engage in natural behavior, be provided with an appropriate environment, have good physical health, and receive appropriate nutrition by equine industry participants, these were not significant ($\chi^2 = 6.9$, $df = 4$, $P = 0.144$; $\chi^2 = 6.7$, $df = 5$, $P = 0.242$; $\chi^2 = 3.9$, $df = 3$, $P = 0.276$; $\chi^2 = 0.5$, $df = 3$, $P = 0.922$, respectively). However, participants agreed that all of these factors were either important or very important in relation to animal welfare. Although 354 of the 379 equine industry participants considered animal agency important or to be very important ($\chi^2 = 10.6$, $df = 5$, $P = 0.06$), 7 participants were unsure, and 18 participants deemed it not important.

3.2. Equine Industry Knowledge of Horses on Cattle Feedlots

Participants involved in the equine industry were aware that horses are used on cattle feedlots ($\chi^2 = 46.84$, $df = 1$, $P < 0.001$). Furthermore, they strongly agreed that cattle welfare has the potential to be improved by the use of horses on feedlots ($\chi^2 = 6.17$, $df = 2$, $P = 0.046$). Survey participants were invited

to comment on the use of horses in cattle feedlots and horse well-being. Comments provided were screened, with $n = 27$ removed due to not being related to the use of horses in a cattle feedlot. The remaining responses ($n = 85$) were subject to thematic analysis, yielding four main themes. These themes were: 1. positive horse welfare on feedlots, 2. negative horse welfare on feedlots, 3. positive impacts on cattle welfare using horses on feedlots, and 4. the Five Domains (Figure 1). Although the Five Domains were not explicitly mentioned in any open-ended responses, these responses were classified under the theme of the Five Domains as they aligned with literature on animal welfare, well-being, and the individual domains.

4. Discussion

Current literature on horses, especially that of performance horses [9,10], clearly demonstrates the increasing value being placed on equine well-being and welfare by the equine industry, likely due to increased general public interest in current practices [15,25,26]. This increased interest has led to greater exposure to the outcomes of horses being subject to practices that, although traditional, may not prioritize horse welfare. The increasing application of the Five Domains Model framework to assess horse welfare in a wide range of common, publicly visible equestrian contexts (or scenarios) has highlighted deficits in equestrian practice and how horses are treated, which has threatened the equine industry's SLO [27]. Although the group of horses under examination in this study are arguably part of the livestock production industry, they represent a category of horses who may escape regular public scrutiny due to not undertaking their work in public settings [7,12,28]. These horses are also often subject to more intense workloads than their counterparts, where the lack of

data and current knowledge may impact their welfare in the nonworking hours as well as the working hours.

The term animal well-being is becoming a common expression for lay people to use in place of welfare due to the less negative connotations it appears to hold with the general public [29]. Although there is no commonly accepted definition of either welfare or well-being, the distinction placed on these two words by the public is also evident in the equine industry, because animal well-being was perceived as being more important by participants when compared with animal welfare. This highlights the fact that the framing of situations matters, which is evident in industry but also in how industry is viewed through SLO by the public [30]. It also highlights how framing and knowledge are important.

In this study, although participants were not made aware of or asked about their knowledge of the Five Domains Model specifically, the survey was designed so that the welfare terms participants were asked to rate were modeled on the Five Domains. This was done in an attempt to gauge participant understanding without altering judgments [31]. A 2021 study of United Kingdom horse owner perceptions of welfare found that 60% of the study participants were unaware of the Five Domains Model before they participated in the study [32]. However, after being made aware of the model, participants' opinions in a second survey were significantly impacted, as was how they viewed several of the domains. Once being made aware of the domains, equine emotional state was rated as of higher importance, while behavior, human interaction, and health were then rated as of lower importance. However, views on both the environment and nutrition domains were not impacted by increased awareness of the Five Domains Model [32].

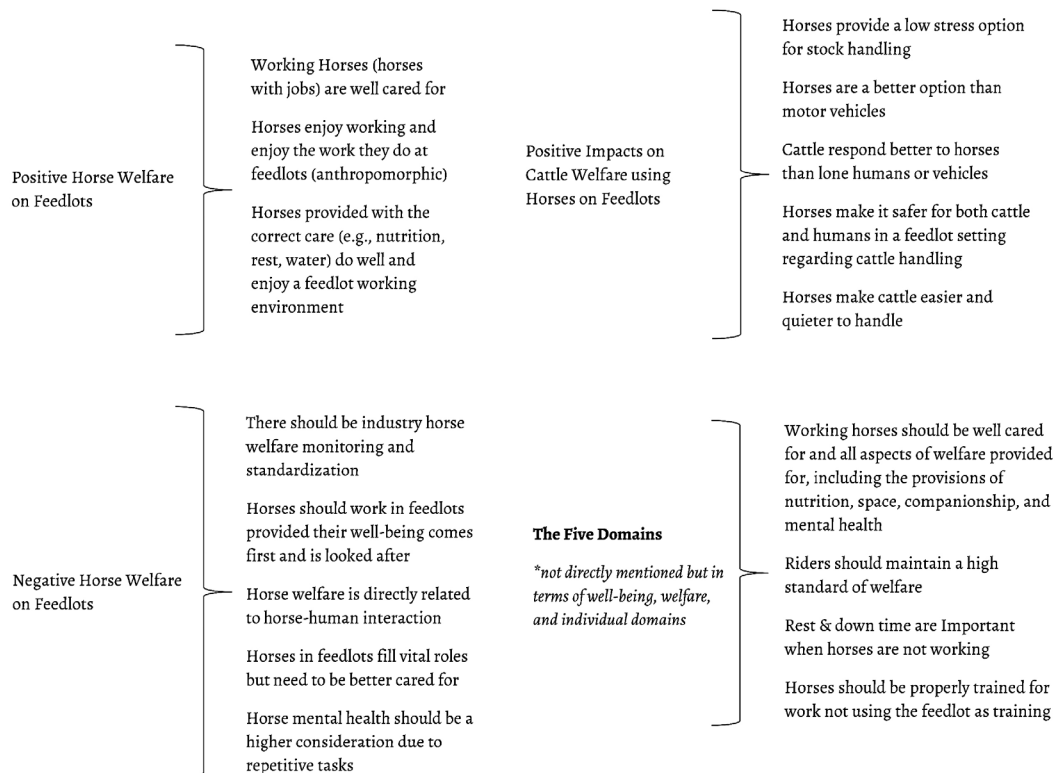


Figure 1: Thematic analysis identified four key themes about cattle feedlot horse welfare from an open-ended survey question.

While survey participants in this study may not have been specifically aware of the Five Domains Model, each domain was clearly seen as important and rated highly in terms of equine welfare, meaning participants thought that each domain or domain-related word was important for horse welfare and animal welfare. The overall importance placed on all welfare words was unanticipated for the equine community. Although the equine community is slowly working toward positive welfare changes, the community can be slow to implement these changes due to cultural norms and a lack of scientific understanding [33–35]. Although the Australian equine community acknowledges the importance of horse welfare and the factors involved in providing good welfare, there is often a stark contrast between the conceptualization of welfare for horses and real-life implemented practices [29,33].

Unsurprisingly, as this study was about horses, it attracted a high number of equine industry participants compared to those working in the general animal industry, meaning there was an increased possibility of bias due to the survey reflecting an equine industry viewpoint. This may mean that industry cannot see the current issues as they are too close to the situation and the situation is filtered through personal experiences and preferences [36]. This situational filter may lead animal owners (in this case equine) to rate their animals' welfare more highly than they do other animals' welfare in similar situations [36,37], and the possibility of emotional well-being of an animal being perceived as greater (happier) than it really is [9,36]. Participants for this survey may have also introduced self-selection bias through the voluntary nature of participation and the dissemination techniques through the university email system, where participants are more likely to respond to surveys that they have experience with or interest in [38]. This limitation, and therefore the subsequent research focus on the equine industry and its views on feedlot working horses, means that although this survey provides information on an unstudied population, the results themselves only provide a point-in-time snapshot for this specific focus group. However, the broader focus of the open-ended questions opens new avenues of research inquiry, as they give insight into how this specific group of participants felt about these horses. While these results cannot be extrapolated in a wider context, they can be used to inform and create more specific future research questions.

The open-ended responses provided in this survey highlighted a generally held view that if feedlot horses are well cared for in all Five Domains, then the horses would thrive, enjoy, and be 'happy' to work in a feedlot environment. Participants stated, "The majority of these horses love what they do and are happy to do it," and "no problem with horses being used in feed lots with cattle as long as their needs are met." In 2004, the Fédération Équestre Internationale (FEI), which governs international equestrian sports, introduced the concept of the 'happy athlete' to the equine industry competition scene [39]. Although this concept was believed to support the improvement of equine performance and welfare by its proposers through improving equine emotional well-being, it does not outline any specific attributes of a 'happy athlete.' Consequently, the term has no clear definition and is therefore open to interpretation. From a

scientific point of view, while this open interpretation may be useful in terms of considering a range of understandings, it can lead to confusion and result in the term acquiring several different meanings depending on what is being discussed and who is discussing it [40]. With no clear definition, the assessment of whether a horse is indeed a 'happy athlete' becomes more complex, as positive affective states remain undeniably difficult to identify and assess, especially when compared with their negative counterparts. This is due to negative states likely being easier to observe, but also being characterized by having a greater range of behaviors [41]. This industry view, i.e., that horses enjoy their job and are 'happy' to work, may lead to riders attributing a greater range of emotional states and experiences to their equine companion than the animal is capable of [42]. Horses, like other animals, possess a complex range of emotions and affective states and associated behavioral responses based on natural motivations which may be different from those of humans [43,44]. While humans may perceive the horse as being 'happy' to perform a certain task, the horse may simply be completing the task as it understands, following trained cues given by the rider, rather than consciously working with the rider to complete the task as a team [9]. Contemporary animal welfare scientists argue that anthropomorphic explanations of animal behavior are unsuitable, particularly during human-animal interactions [45]. However, the opinions expressed in this survey reveal that anthropomorphic beliefs are still widely held and that there is still work to be done to modify them [25,45].

The majority of participants were aware that horses work in Australian feedlots. This may well be due to the Australian affinity with working horses on farms being part of Australian heritage/folklore [46]. In terms of Australian feedlot horses and the work they undertake, no research had been conducted prior to the research presented in this study. In addition to the lack of scientific welfare assessment of horses working in feedlots, industry standards and codes of practice to safeguard these horses' welfare are limited. While the Australian Meat and Livestock Association manual on beef cattle feedlot design and construction provides a comprehensive list for keeping horses and provisions for them on a feedlot site [47], its use is not regulated, and, as a code of practice, compliance with its codes is not mandatory. This means that horse care standards may not only vary between feedlots but also within a single feedlot, as ultimately it is the riders/owners who are responsible for the horse's care. Despite this lack of enforceable legislation, several survey participants in the open-ended responses believed that as long as a horse's needs are met, which includes nutrition, rest, water, and adequate training, then most feedlot working horses will have positive welfare. Participants also thought that not only do the horses experience positive welfare, but their use in feedlots directly impacts cattle welfare, with their use improving cattle welfare.

An animal's previous experiences of being handled will influence its future reactions to handling, i.e., if previously having had a negative experience due to being roughly handled, the animal may be fearful, aggressive, or flighty [48]. Thematic analysis of open-ended responses showed that some participants believed that handling cattle with horses led to the cattle becoming calmer, therefore improving the

safety of the staff handling the cattle. Participants stated, "horses are far more beneficial when working cattle than bikes," and that "working cattle with horses, the cattle are calmer and are easier to educate and handle." However, despite this belief being expressed by survey participants, it is only based on anecdotal evidence, with limited research to support the claim [49]. If the use of horses to manage cattle in feedlots could be found to lead to calmer cattle, this may lead to improvements in cattle welfare if horses were introduced to feedlots in which they are not currently used. However, calmer cattle could simply be a product of calmer handlers who feel safer and less overworked on horseback, or the horse-human relationship may be beneficial to the human-cattle relationship.

5. Conclusion

This study on Australian cattle feedlot horses found that study participants believe the use of horses on a cattle feedlot to be positive for both horses and cattle, provided that the horses' needs are met in terms of the Five Domains Model framework. More research on the Australian feedlot working horse is needed so that the industry does not come under threat of losing its SLO while increasing working horse welfare and perhaps, in doing so, also increasing cattle welfare and the production outputs from a positive horse-human-cattle relationship. While this study is limited by possible self-selection bias of participants and only providing participants' viewpoints in a single timeframe, the results will help build and improve future studies. Future studies could focus on professionals directly involved in feedlots or the horses themselves.

Supplementary Materials

Supplementary Materials contain all survey questions, answers, and skip logic where it applies.

Acknowledgments

This research was conducted as part of a PhD program of study at Charles Sturt University, Australia. Liffen, K., 2025. Australian cattle feedlot working horses: a series of novel studies of welfare under field work conditions. PhD thesis, Charles Sturt University, Wagga Wagga, Australia. The authors would like to acknowledge Gail Fuller from the Charles Sturt University Spatial Data Analysis Network for her support in the design and implementation of the online survey.

Authors' Contributions

K.L.: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Visualization, Writing – original draft, Writing – review & editing. C.H.: Visualization, Writing – original draft, Writing – review & editing. H.R.: Conceptualization, Formal analysis, Methodology, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Data Availability

The data supporting the findings of this study are available on request from the corresponding author.

Funding

This work was supported by an Australian Government Research Training Program scholarship provided by Charles Sturt University.

Conflicts of Interest

The authors declare that they have no known conflicts of interest that could have appeared to influence the work reported in this paper. All co-authors have seen and agree with the contents of the manuscript, and there are no conflicts of interest to report.

Ethical Approval

The survey was approved by Charles Sturt University Human Ethics Committee Approval Authority H20204.

Consent to Participate

Participant consent was gained as part of the survey (see **Supplementary Materials**), and all data were collected anonymously.

Declaration of Generative AI and AI-Assisted Technologies

The authors did not use any artificial intelligence-assisted technologies in the writing process.

References

- [1] Salvin HE, Lees AM, Cafe LM, Colditz IG, Lee C. Welfare of beef cattle in Australian feedlots: a review of the risks and measures. *Animal Production Science* 2020;60:1569–90. <https://doi.org/10.1071/an19621>.
- [2] Munsters C, Visser K, van den Broek J, Sloet van Oldruitenborgh-Oosterbaan MM. Quantifying stress in experienced and inexperienced mounted police horses, using heart rate, heart rate variability, behavior score and suitability score. *Journal of Veterinary Behavior* 2013;8:e16–7. <https://doi.org/10.1016/j.jveb.2012.12.037>.
- [3] Jovanović V, Vučinić M, Voslarova E, Nenadović K. Welfare assessment of stabled horses in five equestrian disciplines. *Journal of Equine Veterinary Science* 2024;143:105203. <https://doi.org/10.1016/j.jevs.2024.105203>.
- [4] Klose RA, Berg EL. Stress-related behavior of horses in adapted therapeutic riding lessons and hippotherapy sessions. *Journal of Equine Veterinary Science* 2019;76:95. <https://doi.org/10.1016/j.jevs.2019.03.133>.
- [5] Trindade PHE, Hartmann E, Keeling LJ, Andersen PH, Ferraz G de C, Paranhos da Costa MJR. Effect of work on body language of ranch horses in Brazil. *PLOS ONE* 2020;15:e0228130. <https://doi.org/10.1371/journal.pone.0228130>.
- [6] Rosser JM, Ardis A. Retrospective review of carriage horse and mule welfare in Charleston, South Carolina (2009–2012). *Journal of Equine Veterinary Science* 2014;34:816–9. <https://doi.org/10.1016/j.jevs.2014.01.002>.
- [7] Ali ABA, El Sayed MA, Matoock MY, Fouad MA, Heleski CR. A welfare assessment scoring system for working equids—A method for identifying at risk populations and for monitoring progress of welfare enhancement strategies (trialed in Egypt). *Applied Animal Behaviour Science* 2016;176:52–62. <https://doi.org/10.1016/j.applanim.2015.12.001>.

- [8] Auer U, Kelemen Z, Engl V, Jenner F. Activity time budgets—a potential tool to monitor equine welfare? *Animals* 2021;11:850. <https://doi.org/10.3390/ani11030850>.
- [9] McGreevy PD, Oddie C, Burton FL, McLean AN. The horse–human dyad: Can we align horse training and handling activities with the equid social ethogram? *The Veterinary Journal* 2009;181:12–8. <https://doi.org/10.1016/j.tvjl.2009.03.005>.
- [10] Mellor DJ, Beausoleil NJ, Littlewood KE, McLean AN, McGreevy PD, Jones B, *et al.* The 2020 five domains model: including human–animal interactions in assessments of animal welfare. *Animals* 2020;10:1870. <https://doi.org/10.3390/ani10101870>.
- [11] Heleski CR, Anthony R. Science alone is not always enough: The importance of ethical assessment for a more comprehensive view of equine welfare. *Journal of Veterinary Behavior* 2012;7:169–78. <https://doi.org/10.1016/j.jveb.2011.08.003>.
- [12] Burn CC, Dennison TL, Whay HR. Relationships between behaviour and health in working horses, donkeys, and mules in developing countries. *Applied Animal Behaviour Science* 2010;126:109–18. <https://doi.org/10.1016/j.applanim.2010.06.007>.
- [13] Hampton JO, Jones B, McGreevy PD. Social license and animal welfare: developments from the past decade in Australia. *Animals* 2020;10:2237. <https://doi.org/10.3390/ani10122237>.
- [14] McManus P. Animal-based entertainment industries, animal death and Social Licence to Operate (SLO): an analysis of 'The Final Race' and the 2019 Melbourne Cup. *Social & Cultural Geography* 2022;24:1242–61. <https://doi.org/10.1080/14649365.2022.2053194>.
- [15] Williams JM. Equestrianism's social license to operate: assumptions, reality and the future. *UK-Vet Equine* 2023;7:196–202. <https://doi.org/10.12968/ukve.2023.7.5.196>.
- [16] Heleski C, Stowe CJ, Fiedler J, Peterson ML, Brady C, Wickens C, *et al.* Thoroughbred racehorse welfare through the lens of 'social license to operate—with an emphasis on a U.S. perspective. *Sustainability* 2020;12:1706. <https://doi.org/10.3390/sui2051706>.
- [17] Jones B, Goodfellow J, Yeates J, McGreevy P. A critical analysis of the British Horseracing Authority's review of the use of the whip in horseracing. *Animals* 2015;5:138–50. <https://doi.org/10.3390/ani5010138>.
- [18] Mellor D. Updating animal welfare thinking: moving beyond the "five freedoms" towards "a life worth living." *Animals* 2016;6:21. <https://doi.org/10.3390/ani6030021>.
- [19] Johnston CH, Richardson VL, Whittaker AL. How well does Australian animal welfare policy reflect scientific evidence: a case study approach based on lamb marking. *Animals* 2023;13:1358. <https://doi.org/10.3390/ani13081358>.
- [20] Pearson G, Douglas J, Wolfram I, Furtado T. Used like pawns or treated like kings? How narratives around racehorse welfare in the 2023 Grand National may affect public acceptance: an informed commentary. *Animals* 2023;13:3137. <https://doi.org/10.3390/ani13193137>.
- [21] Wilson BJ, Thompson KR, McGreevy PD. The race that segments a nation: Findings from a convenience poll of attitudes toward the Melbourne Cup Thoroughbred horse race, gambling and animal cruelty. *PLOS ONE* 2021;16:e0248945. <https://doi.org/10.1371/journal.pone.0248945>.
- [22] Tannenbaum J. Ethics in biomedical animal research: the key role of the investigator a. In: Conn, PM, editor. *Animal Models for the Study of Human Disease*. Second Edition, Academic Press; 2017, p. 1–44. <https://doi.org/10.1016/b978-0-12-809468-6.00001-2>.
- [23] Weary DM, Ventura BA, von Keyserlingk MAG. Societal views and animal welfare science: understanding why the modified cage may fail and other stories. *Animal* 2016;10:309–17. <https://doi.org/10.1017/s17571731115001160>.
- [24] Williams JM, Randle H, Marlin D. COVID-19: Impact on United Kingdom horse owners. *Animals* 2020;10:1862. <https://doi.org/10.3390/ani10101862>.
- [25] Hausberger M, Lesimple C, Henry S. Detecting welfare in a non-verbal species: social/cultural biases and difficulties in horse welfare assessment. *Animals* 2021;11:2249. <https://doi.org/10.3390/ani11082249>.
- [26] Heleski CR. Social license to operate—why public perception matters for horse sport—some personal reflections. *Journal of Equine Veterinary Science* 2023;124:104266. <https://doi.org/10.1016/j.jevs.2023.104266>.
- [27] Mellor DJ, Burns M. Using the five domains model to develop welfare assessment guidelines for thoroughbred horses in New Zealand. *N Z Vet J* 2020;68:150–6. <https://doi.org/10.1080/00480169.2020.1715900>.
- [28] Bukhari SSUH, Parkes RSV, Sneddon LU, McElligott AG. The behavior and welfare of neglected species: some examples from fish and mammals. *PeerJ* 2024;12:e17149. <https://doi.org/10.7717/peerj.17149>.
- [29] Luke KL, Rawluk A, McAdie T, Smith BP, Warren-Smith AK. How equestrians conceptualise horse welfare: Does it facilitate or hinder change? *Animal Welfare* 2023;32:e59. <https://doi.org/10.1017/awf.2023.79>.
- [30] Croney CC. Words matter: Implications of semantics and imagery in framing animal-welfare issues. *Journal of Veterinary Medical Education* 2010;37:101–6. <https://doi.org/10.3138/jvme.37.1.101>.
- [31] Goto Y, Tsugawa K, Furuya Y, Maezato M, Tagami Y, Ogawa Y, *et al.* Behavior of Japanese women after being informed about the benefits and disadvantages of breast cancer screening: a questionnaire survey. *Breast Cancer* 2020;27:739–47. <https://doi.org/10.1007/s12282-020-01071-6>.
- [32] Fletcher K, Cameron L, Freeman M. Contemplating the Five Domains model of animal welfare assessment: UK horse owner perceptions of equine well-being. *Animal Welfare* 2021;30:259–68. <https://doi.org/10.7120/09627286.30.3.003>.
- [33] Maurício LS, Leme DP, Hötzel MJ. The easiest becomes the rule: beliefs, knowledge and attitudes of Equine Practitioners and enthusiasts regarding horse welfare. *Animals (Basel)* 2024;14:1282. <https://doi.org/10.3390/ani14091282>.
- [34] Pickering P, Hockenhull J. Optimising the efficacy of equine welfare communications: do equine stakeholders differ in their information-seeking behaviour and communication preferences? *Animals* 2019;10:21. <https://doi.org/10.3390/ani10010021>.
- [35] Randle H, Waran N. Equitation science in practice: how collaboration, communication and change can improve equine welfare. *Journal of Veterinary Behavior* 2019;29:viii–x. <https://doi.org/10.1016/j.jveb.2018.12.014>.
- [36] Cobb M, Lill A, Bennett P. Not all dogs are equal: perception of canine welfare varies with context. *Animal Welfare* 2020;29:27–35. <https://doi.org/10.7120/09627286.29.1.027>.
- [37] Cheung E, Mills D, Ventura BA. "But my horse is well cared for": A qualitative exploration of cognitive dissonance and enculturation in equestrian attitudes toward performance horses and their welfare. *Animal Welfare* 2025;34:e50. <https://doi.org/10.1017/awf.2025.10028>.

- [38] Silber H, Stadtmüller S, Cernat A. Comparing participation motives of professional and non-professional respondents. *International Journal of Market Research* 2023;65:361–72. <https://doi.org/10.1177/14707853231166882>.
- [39] FEI dressage rules. FEI 2025. <https://inside.fei.org/fei/disc/dressage/rules> (accessed March 20, 2026).
- [40] Reimert I, Webb LE, van Marwijk MA, Bolhuis JE. Review: Towards an integrated concept of animal welfare. *Animal* 2023;17:100838. <https://doi.org/10.1016/j.animal.2023.100838>.
- [41] Mendl M, Burman OHP, Parker RMA, Paul ES. Cognitive bias as an indicator of animal emotion and welfare: Emerging evidence and underlying mechanisms. *Applied Animal Behaviour Science* 2009;118:161–81. <https://doi.org/10.1016/j.applanim.2009.02.023>.
- [42] Bornmann T, Randle H, Williams J. Investigating equestrians' perceptions of horse happiness: an exploratory study. *Journal of Equine Veterinary Science* 2021;104:103697. <https://doi.org/10.1016/j.jevs.2021.103697>.
- [43] De Vere AJ, Kuczaj SA. Where are we in the study of animal emotions? *WIREs Cognitive Science* 2016;7:354–62. <https://doi.org/10.1002/wcs.1399>.
- [44] Lawrence AB, Terlouw EMC. A review of behavioral factors involved in the development and continued performance of stereotypic behaviors in pigs. *Journal of Animal Science* 1993;71:2815–25. <https://doi.org/10.2527/1993.71102815x>.
- [45] Mota-Rojas D, Mariti C, Zdeinert A, Riggio G, Mora-Medina P, del Mar Reyes A, *et al.* Anthropomorphism and its adverse effects on the distress and welfare of companion animals. *Animals* 2021;11:3263. <https://doi.org/10.3390/ani11113263>.
- [46] White L. The role of the horse in Australian tourism and national identity. In: Frew E, White L, editors. *Tourism and National Identities: An international perspective*, Routledge; 2011, p. 65–76.
- [47] Watts PJ, Davis RJ, Keane OB, Luttrell MM, Tucker RW, Stafford R, *et al.* Beef cattle feedlots: Design and construction. *Meat & Livestock Australia*; 2016.
- [48] Grandin T. Livestock-handling assessments to improve the welfare of cattle, pigs and sheep. *Animal Production Science* 2017;58:403–7. <https://doi.org/10.1071/an16800>.
- [49] Grandin T, Oldfield JE, Boyd LJ. Review: Reducing handling stress improves both productivity and welfare. *The Professional Animal Scientist* 1998;14:1–10. [https://doi.org/10.15232/S1080-7446\(15\)31783-6](https://doi.org/10.15232/S1080-7446(15)31783-6).

How to Cite

Liffen K, Henshall C, Randle H. What Is Understood About the Welfare of Horses Working in Australian Cattle Feedlots: An Introductory Survey. *Int J Equine Sci* 2026;5(1):95–102.