

Research article

The influence of animal welfare accreditation programmes on zoo visitor perceptions of the welfare of zoo animals

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Keywords: customer service, quality management, zoo communication, zoo management, zoo visitors

Article history:

Received: 27 Jul 2018

Accepted: 07 May 2020

Published online: 31 Jul 2020

Abstract

In recent years, formal accreditation programmes based upon contemporary animal welfare science have been developed to assess animal welfare within zoos. Animal welfare is an important responsibility for any zoo, but does accreditation provide everyday zoo visitors with assurance about the welfare of the animals they encounter? To answer this question, a survey of visitors to Wellington Zoo in New Zealand was conducted. Survey participants were asked to respond to a variety of animal welfare scenarios involving zoo animals. Scenarios were designed using the Five Domains Model which the Zoo and Aquarium Association (ZAA) use to develop criteria for accreditation standards. Results show animal welfare accreditation programmes assured survey participants about the welfare of animals in the zoo. While this is affirming for those zoos participating in accreditation programmes, the research also found that survey participants were not aware of zoo accreditation programmes. As animal welfare is a core tenet of the social license to operate any zoo, the principal recommendation of this study is for both zoos and accrediting organisations to significantly increase marketing and communication of their accreditation programmes to their communities.

Introduction

In recent years, zoos worldwide have immersed themselves in research, development and implementation of animal welfare science and associated accreditation programmes (Mellor et al. 2015). Zoos' concurrent adoption of quality measurement and quality management systems have enabled rapid animal welfare accreditation uptake (Powell and Watters 2016). However, zoo visitor perceptions are still poorly understood in relation to animal welfare and accreditation practices (Packer et al. 2018).

Insufficient attention has been given to how animal welfare accreditation programmes affect the perceptions of zoo visitors. While most zoo visitors now understand the role of

zoos in education and the conservation of endangered species, some people still express negative opinions about animals being kept in zoos (Reade and Waran 1996; Maynard 2017). A zoo's social license to operate is built on its reputation and the perceptions of both visitors and the broader community within which it exists. Progressive zoos must consider the impact of the opinions, attitudes and values of their visitors, and, at the same time, appreciate how the zoo itself can influence some of these opinions (Gray 2017). While in some parts of the world there is baseline legislation in place for the welfare of animals in human care, many regional zoo and aquarium associations have mandated their own animal welfare standards. In New Zealand, animal welfare laws are under the jurisdiction of the Ministry of Primary Industries (Morris 2011). The Australasian

regional accreditation standards set by the Zoo and Aquarium Association of Australasia (ZAA) go much further: by adopting the latest science surrounding the Five Domains framework and the affective positive welfare states of animals (Zoo Aquarium Association Australasia and Mellor 2013). The ZAA requires animal welfare accreditation for any zoo, sanctuary or aquarium to become, or remain, a member.

There is consensus across the literature that, in general, zoo visitors and the broader community are concerned about the welfare of animals in zoos (Woods 2002; Melfi et al. 2004; Davey 2007; Claxton 2011; Miller 2012; Whitham and Wielebnowski 2013; Keulartz 2015; Lee 2015; Powell and Watters 2016) and previous studies have examined the perceptions of visitors about animal welfare. Melfi et al. (2004) found that most visitors believe they understand animal welfare intuitively and their concerns come from an emotional perspective. Miller's (2012) study looked into visitor reactions to the pacing of a tiger: a behaviour often associated by visitors with a negative welfare state, despite not always being an abnormal or stereotypic behaviour. Miller's study found that visitors viewing a pacing tiger perceived that the tiger was receiving lower levels of care than those viewing the tiger resting. Miller et al. (2018) studied the relationship between viewing elephants in Association of Zoos and Aquariums in America (AZA) accredited zoos and perceptions of animal welfare (as well as conversation predispositions). They found perceptions of animal welfare were significantly related to positive emotional experience dependent on elephant behaviours. Godinez and Fernandez (2019), in their analysis of research on zoo visitor behaviour, say zoo visitors have more positive perceptions and behaviours about zoos, their animals, and conservation initiatives the more they interact with the zoo on a variety of levels. These studies all indicate that visitor perceptions of animal welfare are important to a zoo's credibility. Encouraging repeat visitors and more communication appear to be key elements of achieving zoo goals. However, the perceptions of zoo visitors about the role accreditation plays in animal welfare is still under-researched.

Although the average zoo visitor does appear to possess some knowledge of animal welfare issues and corrective actions, such as pacing and behavioural enrichment, visitors generally appear to be making assumptions based on a limited understanding of the issues. As argued by Melfi et al. (2004) "... it is clear that public perceptions of animal welfare are driven by their own feelings, rather than based on a sound understanding of welfare issues and how to evaluate them" (p. 106).

The study considered how objective, science-based animal welfare accreditation of zoos aligned with the more subjective zoo visitor perspectives of zoo animal welfare. In addition, the study sought to determine whether accreditation provides zoo visitors with satisfactory assurances as to the welfare of animals found in accredited zoos. Specifically, this research report explored perceptions of visitors to Wellington Zoo in New Zealand to answer the question: Does animal welfare accreditation assure visitors of the welfare of animals they see in zoos?

Method

The survey was designed to find out if animal welfare accreditation assures visitors of the welfare of animals they see in Wellington Zoo. Four vignettes were provided with three different scenarios where respondents could select one of three ordinal variables relating to their value judgement on the welfare state of the animal featured. Scenarios presented in the vignette questions reflected the four physical domains of the Five Domains model which are used by and were adapted from, the ZAA accreditation framework (Zoo Aquarium Association Australasia 2015).

Immediately prior to conducting this research, results were

released from a survey conducted by the AZA which featured several questions that inquired into the role of accreditation in driving support for zoos and aquariums within North America (Association of Zoos and Aquariums 2017). To increase the relevance and validity of this study, the design of some of the initial questions were adapted to allow some comparison to this AZA survey, so that wider conclusions might be drawn beyond the sample to other zoos (Bryman and Bell 2015).

The research was conducted through an anonymous, self-completed, online questionnaire. Wellington Zoo maintains a database of 15,330 unique email addresses (as at November 2017) of people who have opted to engage with the organisation and receive a newsletter. This database mostly consists of zoo visitors, with approximately 3,800 being Zoo Crew members who hold an annual visitor pass. A message and associated hyperlink were included in the monthly zoo e-newsletter sent on 7 November 2017 inviting participation in the survey. A further e-newsletter invitation was sent on 17 November 2017. Limitations of this sampling technique, including the fact that respondents have an existing affinity to the Zoo, are explored further in the implications section.

This research project was assessed as being low risk under the Massey University Code of Ethical Conduct for Research, Teaching and Evaluations Involving Human Participants. Low-risk notification was made to the University on 5 October 2017 (Ethics Notification Number: 4000018526). Voluntary and informed consent was described at the start of the survey, with a clear statement that the completion of the survey implied consent.

A total of 574 responses to the survey were received between 7 and 27 November 2017, with a 91% completion rate. A total of 395 respondents completed the survey. The sample was restricted to those who were 18 or over and those who had visited Wellington Zoo at least once in the past year. The reason for this restriction was that the newsletter database includes virtual supporters, such as international supporters. Participants were restricted to those who had physically visited the Wellington Zoo so that the term 'zoo visitor' was meaningful. The sample of 395 represented 2.6% of those who were sent an invitation to participate. Zoo Crew members, who hold an annual pass to Wellington Zoo, made up 30.5% of the total sample.

Contingency tables were drawn up to examine the pattern of relationships between the initial variables and the dichotomous variables from the first follow-up question, while χ^2 tests were used to calculate correlation of these relationships (Denis 2018). To examine the relationships between the initial vignette variables and the variables arising from the second follow-up question, a simple weighted score analysis was undertaken (Denis 2018). A score of +1 was given to the positive welfare variable, a score of 0 for the neutral welfare variable, and a score of -1 for the negative welfare variable. Responses were then coded accordingly for each vignette and the second follow-up question. Analysis was then undertaken of the difference in average score between the initial vignette question and the second follow-up question.

Results

While the overall research sample was 395, the number of responses to individual survey questions varied between $n=391$ to $n=395$. This was due to some questions being skipped by respondents even though they completed the survey. The actual sample size for each question being examined in this section will be referenced by the appropriate n value.

Importance and awareness of animal welfare

Respondents were asked two questions about the importance of the general concept of animal welfare in New Zealand zoos. Firstly,

Table 1. Relationship between assessment of pacing tiger and knowledge of zoo being accredited.

Does subsequent knowledge that the zoo is accredited for animal welfare give assurance as to the welfare of the tiger?			Yes	No	Unsure	Total
Tiger scenario initial welfare assessment (nutrition and behaviour domains)	Positive welfare	Count	120	4	2	126
		%	95.2%	3.2%	1.6%	100.0%
	Neutral welfare	Count	118	20	26	164
		%	72.0%	12.2%	15.9%	100.0%
	Negative welfare	Count	46	37	21	104
		%	44.2%	35.6%	20.2%	100.0%
Total	Count	284	61	49	394	
	%	72.1%	15.5%	12.4%	100.0%	

$\chi^2(4, n=394)=79.66, P<0.001.$

consideration was given to whether respondents believed there should be animal welfare standards for New Zealand zoos. A total of 99.7% of respondents answered in the affirmative and only one in the negative (n=392).

A follow-up question asked whether respondents believed there should be some form of animal welfare oversight of New Zealand zoos. A total of 80.5% of respondents believed there should be oversight, 13.9% replied that they did not know, and 5.6% said they believed no oversight was required (n=395).

Respondents were asked if they were aware of any animal welfare accreditation of New Zealand zoos. A total of 81.7% were not aware and 18.3% answered that they were aware of such accreditation (n=393).

Respondents were asked about their awareness of the ZAA as an organisation, and as the official accrediting body for New Zealand zoos. Figure 1 shows that most respondents consider that a zoo sector organisation would be the most appropriate body to accredit zoos. Zoo Crew membership did not present a significant difference in the animal welfare accreditation assurance levels across all the scenarios questions (only +0.7% on average).

Figure 2 provides a graphical presentation of the levels of public awareness of a list of six animal-centric organisations and compares this to the responses for which organisation was likely to

be providing New Zealand zoos with animal welfare accreditation.

Respondents were more likely to be aware of animal rights advocacy organisations than the accrediting organisation for New Zealand zoos, the ZAA. Even though the ZAA was the least recognised of the six animal-centric organisations, they were perceived as most likely to be providing accreditation (other than the SPCA) (Figure 2).

Animal welfare perceptions

Respondent attitudes were sought to a presented hypothetical scenario encompassing aspects of both the nutrition and behaviour domains of the Five Domain model (Mellor and Beausoleil 2015). Specifically, a tiger was presented as pacing back and forth along the front of the viewing area at a never-before visited zoo. Other factors which the literature believes can influence visitor perception were presented favourably in the scenario in order to limit any influence; specifically, the tiger’s habitat was described as large, green, naturalistic and well cared for.

A total of 32.0% of respondents stated that their first thought about the welfare of this tiger was that it was experiencing a positive welfare state. A further 41.6% felt it had neutral welfare and 26.4% stated that their first thought was the tiger was experiencing negative welfare (n=394).

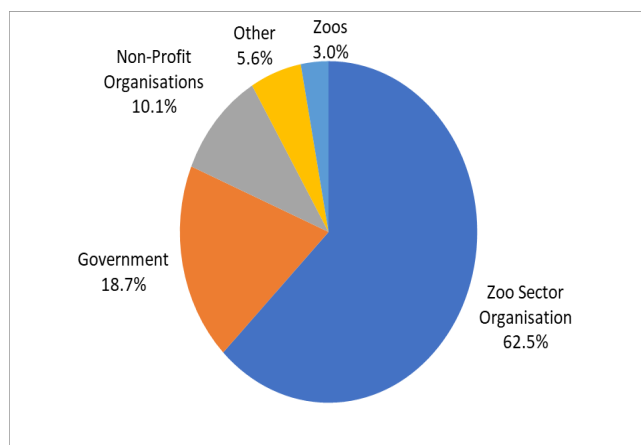


Figure 1. Who should be the accrediting body for New Zealand zoos (n=395).

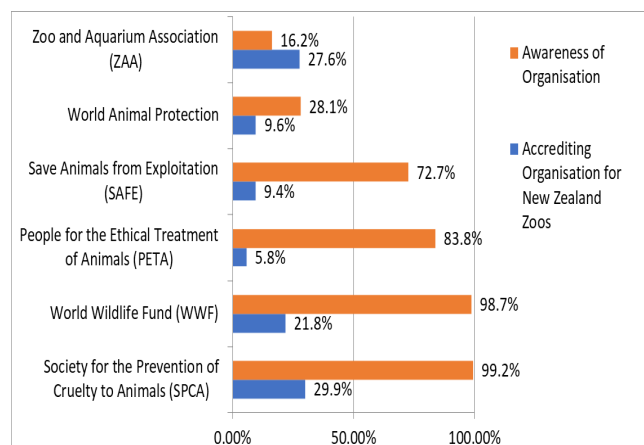


Figure 2. Awareness of animal-centric organisation providing accreditation (n=395).

Table 2. Relationship between assessment of otters huddling in the cold and knowledge of zoo being accredited.

Does subsequent knowledge that the zoo is accredited for animal welfare give assurance as to the welfare of the otters?			Yes	No	Unsure	Total
Otters scenario initial welfare assessment (environment domain)	Positive welfare	Count	202	15	13	230
		%	87.8%	6.5%	5.7%	100.0%
	Neutral welfare	Count	107	14	13	134
		%	79.9%	10.4%	9.7%	100.0%
	Negative welfare	Count	15	9	7	31
		%	48.4%	29.0%	22.6%	100.0%
Total:	Count	324	38	33	395	
	%	82.0%	9.6%	8.4%	100.0%	

$\chi^2 (4, n=395)=29.64, P<0.001.$

Respondents were then advised that the zoo in the scenario was accredited for animal welfare. They were asked if this knowledge would give assurance as to the welfare of the tiger. While 72.2% said yes, 15.4% no and 12.4% did not know (n=395).

As shown in Table 1, 95.2% of the respondents who initially rated the welfare as positive said that knowing the zoo was accredited gave them assurance. While 72.0% of respondents who rated the welfare as neutral agreed that accreditation gave them assurance, 44.2% of respondents who rated the welfare as negative felt that the accreditation gave them assurance.

Respondents were finally presented with additional information about the scenario, specifically that the tiger was to be fed in the next 10 minutes. They were asked to re-complete the same welfare assessment that they had initially completed but considering this subsequent knowledge. A total of 82.5% of respondents rated the tiger as experiencing positive welfare, 15.5% neutral welfare and 2.0% negative welfare (n=394).

Based on a weighted score, where +1 is given to each response that is positive welfare, 0 for neutral welfare, and -1 for negative welfare, the average score for the initial welfare assessment of the tiger was 0.056, while the average score of welfare assessment of the tiger upon receiving the additional information was 0.805. There was a variance between the two assessments of 0.749 (n=394).

Three further scenarios were presented to respondents, each following the same process as the tiger scenario but encompassing other domains of the Five Domain model. The second scenario, representing the environment domain, presented respondents with a hypothetical group of otters huddled up against each other for warmth on a very cold winter's day. Table 2 shows the relationship between the initial assessment of the welfare of the otters and whether animal welfare accreditation provides assurance as to the welfare of the otters.

The additional information subsequently given to respondents for them to re-complete the three-option animal welfare assessment was that the otters were lying on a heated rock. Based on the same weighted score analysis as for the tiger scenario, the average score for the initial welfare assessment of the otters was 0.504, while the average score of welfare assessment of the otters upon receiving the additional information was 0.919: a variance between the two assessments of 0.415 (n=395).

The third scenario, representing the health domain, described a spider monkey limping as it walked past the visitor. Table 3 shows the relationship between the initial assessment of the welfare

of the spider monkey and whether animal welfare accreditation provides assurance as to the welfare of the spider monkey.

The additional information subsequently given to respondents for them to re-complete the three-option animal welfare assessment was that the spider monkey had just been returned to the habitat after being treated at the veterinary clinic and was recovering well. Based on the same weighted score analysis as for the other scenarios, the average score for the initial welfare assessment of the spider monkey was -0.221, while the average score of welfare assessment of the spider monkey upon receiving the additional information was 0.934: a variance between the two assessments of 1.155 (n=395).

The fourth and final scenario, representing the behaviour domain, described a serval that was seated and unmoving at the base of a pole for five minutes. Table 4 shows the relationship between the initial assessment of the welfare of the serval and whether animal welfare accreditation provides assurance as to the welfare of the serval.

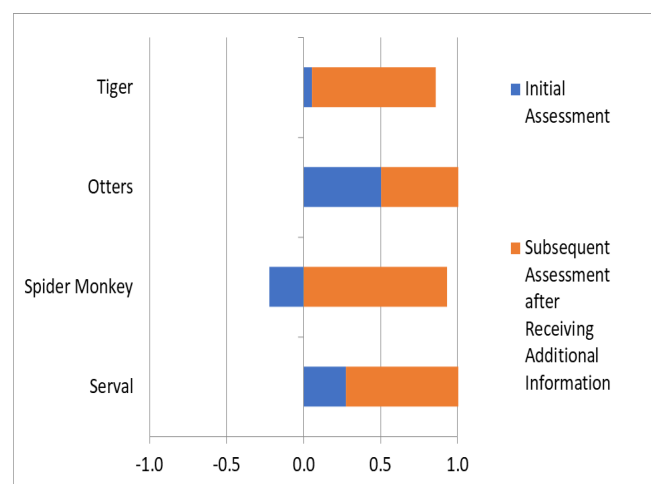


Figure 3. Average weighted score of the initial and subsequent animal welfare assessments of each scenario (n=394, 395, 394, 395).

Table 3. Relationship between assessment of limping spider monkey and knowledge of zoo being accredited.

Does subsequent knowledge that the zoo is accredited for animal welfare give assurance as to the welfare of the spider monkey?			Yes	No	Unsure	Total
Spider monkey scenario initial welfare assessment (health domain)	Positive welfare	Count	45	3	1	49
		%	91.8%	6.1%	2.0%	100.0%
	Neutral welfare	Count	153	25	30	208
		%	73.6%	12.0%	14.4%	100.0%
	Negative welfare	Count	69	35	32	136
		%	50.7%	25.7%	23.5%	100.0%
Total:		Count	267	63	63	393
$\chi^2 (4, n=393)=35.18, P<0.001$		%	67.9%	16.0%	16.0%	100.0%

The additional information subsequently given to respondents for them to re-complete the three-option animal welfare assessment was that after seeing the serval sit unmoving for five minutes it then jumped to the top of the pole and retrieved some meat a keeper had previously placed there. Based on the same weighted score analysis as for the other scenarios, the average score for the initial welfare assessment of the serval was 0.274, while the average score of welfare assessment of the serval

upon receiving the additional information was 0.934: a variance between the two assessments of 0.863 (n=394).

Figure 3 provides a graphical representation of the average weighted score of the initial and subsequent animal welfare assessments for all four scenarios.

Findings across all four scenarios for participant perceptions of all four different animals – tiger, otter, serval and spider monkeys – show that having information about zoo accreditation significantly positively affected participants’ perception of animal welfare.

The final question asked by the survey was a multiple response question about the most important factors for good animal welfare in zoos. Seven statements were randomly presented, and respondents were able to select up to four. Four of the statements were paraphrased from the ZAA Animal Welfare Accreditation Framework (Zoo Aquarium Association Australasia 2015); with each statement representing one of the four physical domains from the Five Domains model. Figure 4 shows the overall results from the multiple response analysis, with asterisks indicating the four statements from the ZAA Animal Welfare Accreditation Framework.

Results show respondents concur with the significance of the four domains included in the survey as they were rated in the top five factors. However, the respondents clearly rate the factor ‘Zoo enclosures are naturalistic and replicate the wild environment’ as important to animal welfare, as it was rated third most important.

Discussion

The results of this study show respondents were not aware of animal welfare accreditation programmes. However, despite this lack of awareness, most respondents agreed with the notion that there ought to be independent oversight of animal welfare in New Zealand zoos.

Most respondents consider that a zoo sector organisation should be the body that sets the standards. This had not been the expected outcome as, based on the existing regulatory environment in New Zealand, as the assumption had been that the government or their agents (e.g. MPI) would have been the visitors’ preferred accrediting body. This result has implications for the role zoos and the ZAA must jointly play to promote the accreditation programme in the future, particularly in ensuring communication of the accrediting standards with relevant government agencies and promotion of the accreditation programme to the community at large.

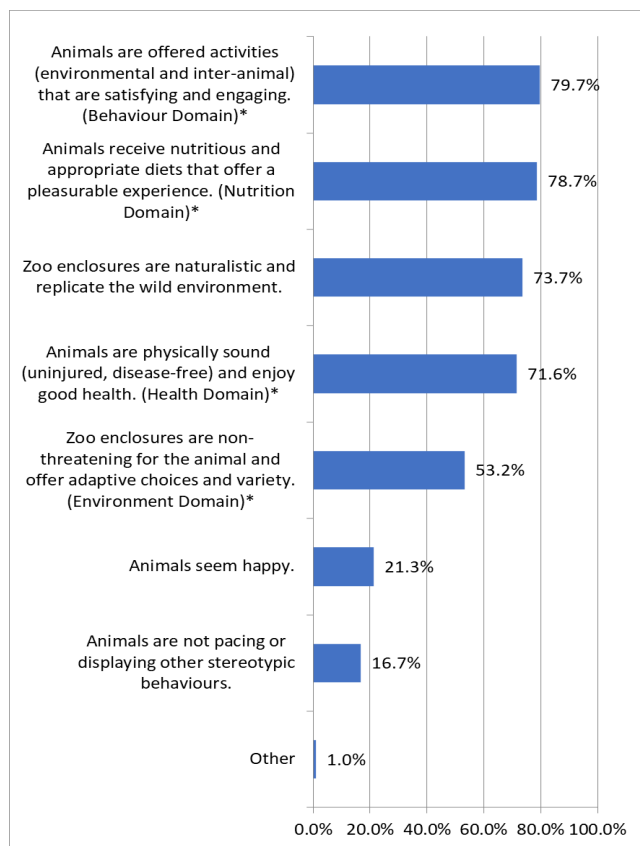


Figure 4. The most important factors for good animal welfare in zoos according to respondents (n=395).

Overall, results suggest that if zoo visitors are aware of a zoo being accredited for animal welfare, they are assured about animal welfare. The results revealed that this is the case irrespective of the initial welfare state and without the need for further contextual information being presented. Further analysis allowed the level of visitor assurance gained from the accreditation programme to be tested against the perceived welfare state of an animal. Across all four scenarios tested, an average of 75% of respondents who rated an animal as being in a neutral welfare state were inclined to say they were subsequently assured by the accreditation status of the zoo. As was expected due to well-established cognitive biases (Bryman and Bell 2015), people who rated an animal's initial welfare state as negative were not as readily assured by the knowledge that the zoo was welfare accredited. These findings were consistent across all four scenarios tested.

Results from the tiger pacing scenario support the earlier results from the study by Miller (2012) where visitors equate tiger pacing with lower levels of welfare. These results indicate that visitors seem to consider that animal pacing is a stereotypy that they accordingly do not equate with overall positive welfare. Upon being advised that the tiger was pacing because it was anticipating food, visitors changed their assessment, with a significant swing to perceiving positive welfare.

Similar reassessments occurred across all four scenarios, and it could be argued that more explanation is an effective way to alter perceptions of zoo visitors. The resultant learning for zoos is the need to provide contextual explanation as to the welfare experiences of the animals and to communicate how zoos evaluate welfare states. In turn, this will educate visitors on modern, objective animal welfare science and best practice in zoos.

It is important to acknowledge the limitations of this research. The sample was limited to visitors to Wellington Zoo who visit at least once a year. Data and results were therefore biased to the experience of those with knowledge of Wellington Zoo, and whom have an interest in the zoo and zoo animals. Non-visitors or those from a different location would possibly have answered differently. The sample is an 'affinity audience' and this bias in the sample might have other effects on results. The concept of an accrediting body may be attractive to this audience, and this affinity may produce confirmation bias. Participants may be aware that well-known organisations like PETA promote anti-zoo narratives and so would not likely be engaged as accrediting organisations, but beyond that participants, even regular zoo visitors as in the sample of this study, probably have little understanding of independent regulating groups.

Only 16% of participants have heard of the ZAA. Accrediting welfare organisations do not appear to be perceived as a legitimate authority in the matter of animal welfare. Consequently, accrediting bodies have a responsibility to focus on communicating their role in accrediting zoos to the wider community. Accrediting bodies and members should work together to undertake community marketing and communications campaigns for accreditation programmes. Without substantive effort to communicate standards and quality, less reputable zoos could co-opt the concept of accreditation to suggest that substandard zoos are on par with those that meet more stringent standards, such as independent accreditation by experts in zoo and aquarium management and animal welfare.

Conclusion

The findings of this study suggest that, with enough information, the general concept of formal animal welfare accreditation may provide zoo visitors with a level of assurance of the welfare of animals they see while visiting an accredited zoo. Animal welfare accreditation could have a significant role to play in assisting progressive zoos to continue to proactively engage in societal

conversation around the welfare of animals in human care, but more research is needed to ascertain how to communicate accreditation so that zoo visitors feel assured animal welfare is being managed appropriately.

Acknowledgements

This research was supported by Wellington Zoo's Animal Welfare Committee. We thank our colleagues from both Wellington Zoo and Massey University who provided expertise and insight that assisted with this study.

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