

Answers to supplementary questions

Questions are in red and bold. Answers are in normal font.

- 1. In your research, why did you not actually visit any circuses, rather than choosing to gather your information from websites?**

My co-authors and I were asked to provide the Welsh Government with “an impartial literature review and an analysis of the scientific evidence that was available”. This is explained in the first paragraph of the Executive Summary of our report (hereafter referred to as the Dorning report). Our remit was to review scientific evidence that was available already, and not to conduct new research. As a result, this means that the Dorning report is a review, not research. Reviews do not contain new information: they compile information that is already available.

We also did not collect information from websites. We deliberately excluded them, as explained on page 33 of the Dorning report.

- 2. How did you justify this research to be comprehensive without conducting onsite observations of operating circuses?**

See my answer to question 1.

- 3. Dr Ted Friend who was funded to conduct research in 1990’s and continues that research through actually onsite observations has criticised your report quite heavily including in front of an Italian Senate hearing? Are you aware of these criticisms?**

I am aware that Dr Friend has criticised the Dorning report. However, he is one of over 2000 scientists that we cited in the report, and to my knowledge nobody else has complained.

- 4. Did you and Dr Stephen Harris deliberately set a criteria for your report by only citing reviewed journal articles with three or more authors so largely the works of Dr Ted Friend, and Dr Martha Worthington’s research which highlights contrary views to yours would be not included?**

Please read page 32 and 33 of the Dorning report, where we explain, in detail, the search terms and inclusion criteria that were used for the literature review. Here we specify that we included all peer-reviewed papers (journal articles), irrespective of the number of authors, unless it ‘used unreliable methods or whose conclusions were not supported by the data’. We did exclude *reports* written by fewer than three authors, since reports (not journal articles) are not typically peer reviewed. The purpose of our inclusion/exclusion criteria was to define what constituted robust scientific evidence, and in the scientific community peer-review is the standard way to judge scientific quality.

Dr Friend and Dr Worthington are both cited in the Dorning report several times and they were both consulted during the review process. They both contributed to the questionnaire

surveys (although Dr Friend asked to remain anonymous) and their opinions were given equal weight to any other response.

5. Dr Ted Friend accused your paper as manipulating his research to hurt good people in circuses around the world? How do you respond to that?

I disagree – this would be unprofessional, unscientific and unnecessary.

6. In your research paper 34/72 citations are to unrefereed publications, unpublished reports or word of mouth and these are given equal weighting to other sources. How does such an approach lead to accurate assessment.

I do not understand what the phrase “34/72 citations” refers to, since the Dorning report contains many more than 72 citations. The report is divided into sections that discuss different issues and therefore cite different sources of information relevant to those specific issues. Opinions were a key part of some of these sections:

- The introductory section contains information about policy and legislation. The Welsh Government encouraged us to consult relevant experts around the world regarding these issues (see page 10), and so the citations in this section include personal communications received in response to inquiries that we sent to these experts, asking for clarification about the laws relating to wild animals in circuses in their country or region of expertise.
- In Appendix 1 we discuss the definition of a non-domesticated animal. Definitions are somewhat subjective, and so this section includes some opinions from relevant experts.
- Appendices 2-6 relate to our expert opinion analysis, which we used to help identify the key issues to compile evidence about in our scientific review. We reflect on the differences in opinion that we observed between expert groups in some parts of the report, but in an objective and scientific manner, and these opinions did not lead us to our final conclusions.
- Appendix 7 is the scientific literature review and contains several hundred references. The criteria for which sources of information to include in this section is explained on page 33 of our report: we were completely transparent about our methods.

7. How do you explain that your report is described as 180 degree spin from Dr Ted Friend’s comprehensive research dating back to 1990 which actually included onsite observation of circus operations?

Reviews compile information from a broad range of sources and draw their conclusions based on an analysis of all of the information in combination. With respect, Dr Friend’s research was a small chunk of the hundreds of texts that we read as part of our review process.

It is also worth noting that the quality and significance of a piece of research is revealed after it is published, based on how the research community respond to it. It is widely accepted that the best measure of the scientific impact of a publication is its number of citations.

To demonstrate this point, the two tables below show the papers that were cited in the Dorning report by Dr Friend and, as a comparison, by Dr Clubb, and the number of citations that each of these papers had as of September 15th, 2020, according to Google Scholar (<https://scholar.google.com>).

The average number of citations for Dr Clubb's papers is 244, whereas the average number of citations for Dr Friend's papers is 23. This shows how the scientific community as a whole has judged the quality of Dr Friend's research. We had no reason to manipulate or misrepresent his work.

Dr Friend's papers

Dorning report citation reference number	Full reference	Number of citations on Google Scholar
159	Friend, T.H. (1999) Behavior of picketed circus elephants. <i>Applied Animal Behaviour Science</i> , 62, 73-88.	42
160	Gruber, T.M., Friend, T.H., Gardner, J.M., Packard, J.M., Beaver, B. & Bushong, D. (2000) Variation in stereotypic behavior related to restraint in circus elephants. <i>Zoo Biology</i> , 19, 209-221.	59
167	Krawczel, P.D., Friend, T.H. & Windom, A. (2005) Stereotypic behavior of circus tigers: effects of performance. <i>Applied Animal Behaviour Science</i> , 95, 189-198.	12
179	Nevill, C.H. & Friend, T.H. (2006) A preliminary study on the effects of limited access to an exercise pen on stereotypic pacing in circus tigers. <i>Applied Animal Behaviour Science</i> , 101, 355-361.	9
180	Nevill, C.H., Friend, T.H. & Windom, A.G. (2010) An evaluation of exercise pen use by circus tigers (<i>Panthera tigris tigris</i>). <i>Journal of Applied Animal Welfare Science</i> , 13, 164-173.	3
233	Nevill, C.H., Friend, T.H. & Toscano, M.J. (2004) Survey of transport environments of circus tigers (<i>Panthera tigris</i>). <i>Journal of Zoo and Wildlife Medicine</i> , 35, 167-174.	5
278	Friend, T.H. & Parker, M.L. (1999) The effect of penning versus picketing on stereotypic behavior of circus elephants. <i>Applied Animal Behaviour Science</i> , 64, 213-225.	38
918	Toscano, M.J., Friend, T.H. & Nevill, C.H. (2001) Environmental conditions and body temperature of circus elephants transported during relatively high and low temperature conditions. <i>Journal of Elephant Managers Association</i> , 12, 115-149.	16
924	Friend, T.H. (2001) A review of recent research on the transportation of horses. <i>Journal of Animal Science</i> , 79 (Suppl. E), E32-E40.	51
926	Nevill, C.H. & Friend, T.H. (2003) The behavior of circus tigers during transport. <i>Applied Animal Behaviour Science</i> , 82, 329-337.	18
927	Williams, J.L. & Friend, T.H. (2003) Behavior of circus elephants during transport. <i>Journal of Elephant Managers Association</i> , 14, 8-11.	4
Average number of citations		23

Dr Clubb's papers

Dorning report citation reference number	Full reference	Number of citations on Google Scholar
128	Mason, G., Clubb, R., Latham, N. & Vickery, S. (2007) Why and how should we use environmental enrichment to tackle stereotypic behaviour? <i>Applied Animal Behaviour Science</i> , 102 , 163-188.	513
165	Clubb, R. & Mason, G. (2003) Captivity effects on wide-ranging carnivores. <i>Nature</i> , 425 , 473-474.	404
166	Clubb, R. & Mason, G.J. (2007) Natural behavioural biology as a risk factor in carnivore welfare: how analysing species differences could help zoos improve enclosures. <i>Applied Animal Behaviour Science</i> , 102 , 303-328.	233
508	Clubb, R. & Mason, G. (2002) <i>A review of the welfare of zoo elephants in Europe: a report commissioned by the RSPCA</i> . Southwater, West Sussex: RSPCA.	106
734	Clubb, R., Rowcliffe, M., Lee, P., Mar, K.U., Moss, C. & Mason, G.J. (2009) Fecundity and population viability in female zoo elephants: problems and possible solutions. <i>Animal Welfare</i> , 18 , 237-247.	59
762	Clubb, R., Rowcliffe, M., Lee, P., Mar, K.U., Moss, C. & Mason, G.J. (2008) Compromised survivorship in zoo elephants. <i>Science</i> , 322 , 1649.	146
Average number of citations		244

8. Why did your research paper contain no empirical research on circus animals?

See my answer to question 1.

9. Why was the report rebranded when launched in Scotland as the Dorning review when you were just a Graduate researcher rather than Dr Harris who was clearly the architect of this work?

The Dorning report was not ‘rebranded’ when it was launched in Scotland. The order of authorship on the report follows standard academic conventions based on relative contribution and it is common practice to refer to a report by the name of the first author.

It is also *Professor* Harris, not Dr Harris, and I was a final year PhD student (post-graduate), not a graduate student.

10. Is it appropriate to refer to the research as ‘peer review’ given it was conducted by avowed critics who differ philosophically – and they were not an academic panel assembled for the purpose of dispassionate review?

If the question is referring to my co-authors and I as the ‘avowed critics’, I would affirm that neither Professor Harris nor I had a preconceived view on this issue: before I was asked to be involved in the review, Professor Harris specifically checked that I had no views on the issue. We also do not campaign on the issue.

If the question is actually meant to be “*Is it appropriate to refer to the research as ‘peer reviewed’*” and so is referring to the three experts that peer-reviewed the report prior to publication as the ‘avowed critics’, then I refer you to my answer to question 11 below.

I will also point out that these referees were chosen carefully for their depth and breadth of knowledge and experience, both academically and practically, and their differing and complimentary perspectives. They reviewed the report independently, not as a panel, and this is the usual way that peer review is done. I will also remind you of the overall role of a peer reviewer: to identify scientific failings by the authors. It is not up to them to agree with what is written; that is for the scientific community to pass judgement on after publication.

11. Dr Ros Clubb and Ron Aitkinson both had made public statements in the past expressing their disapproval of circuses. Dr Ros Clubb stated in 2011 “... the days when it was acceptable to haul wild animals around in beast wagons to be gawped at and to entertain with unnatural tricks are long gone” Ron Aitkinson stated in 2009 “... asking these majestic animals to behave in a unnatural ways in the name of entertainment is a disgrace”

Did either of these two people declare this bias to your team before conducting the peer review? If so how was this clear bias managed?

Our report was a scientific review, and so it was appropriate for it to be peer reviewed by people with scientific expertise. The Welsh Government asked Professor Harris to have our report peer reviewed by three internationally-recognised experts who had different scientific perspectives.

Our referees were Dr Rob Atkinson (not ‘Ron Aitkinson’), Dr Ros Clubb and Professor Geoff Hosey. Each of these people had a different background and perspective on the issues reviewed in our report, and together they offered a broad range of academic and practical expertise relevant to the welfare of wild animals in circuses.

I have included a profile of each referee summarising their vast and relevant expertise. I hope this helps to clarify that the approval of these three experts does constitute a solid peer review of our report.

- Dr Atkinson has worked at zoos and safari parks as an elephant keeper, visited circuses as a member of the UK government’s Circus Working Group, was Head of Wildlife for the RSPCA (Royal Society for the Prevention of Cruelty to Animals) and CEO of the Elephant Sanctuary in Tennessee, home to retired circus and zoo elephants.
- Dr Clubb has studied the behaviour and welfare of carnivores and elephants in zoos, served on the UK Government's Zoo Expert Committee, and worked for the RSPCA specialising in captive wild animals used in entertainment, the media and as pets.
- Professor Hosey has spent his career working across academia and practice and has published numerous research papers and books, including the popular textbook *Zoo Animals: Behaviour, Management and Welfare*. He was Chair of the Welfare Committee of the Primate Society of Great Britain and a long-term member of BIAZA’s (the British and Irish Association of Zoos and Aquariums) Research Committee.

12. In your evidence before our inquiry you stated that it was peer reviewed by 3 people, do you believe the peer review process to be valid given that 2 out of 3 people had a clear bias towards a preconceived outcome?

My answer to question 11 shows the diversity of expertise of our three referees.

The role of the referees was not to decide whether they agreed with the report (as explained above, the significance of a publication is decided by the wider scientific community after it is published).

The report was also reviewed post-publication by the University of Bristol's Legal Services following a letter of complaint they received about the Dorning report, 'alleging bias and misrepresentation of research'. In evidence to the Scottish Parliament, Anthony Beckwith stated that he was the complainant. On 26 January 2017 the Director of Legal Services informed us that the report had been reviewed under strict conditions of confidentiality by an independent reviewer 'who found no evidence that would warrant further investigation' and that the file had been closed. All British Universities have very strict codes of research conduct, and a breach of those regulations is a disciplinary issue. Yet the independent review process concluded that the Dorning report was scientifically objective and adhered to the University of Bristol's high academic standards.

13. Dr Ted Friend specifically states in response to your paper "She purposefully hid and when she didn't hide, she twisted objectively-collected data out of her report." How do you respond to such criticisms of your work?

I do not know what prompted this malicious accusation. I have never 'hidden', as demonstrated by my willing participation in this inquiry. Furthermore, our report was peer-reviewed before publication, and an independent reviewer hired by the University of Bristol has also confirmed that the report meets a high standard of scientific integrity. It is offensive to suggest that I, my co-authors or the reviewers behaved in an unprofessional manner.

14. Is it true that Dr Stephen Harris was dismissed from Bristol university shortly after the university received the complaints from Dr Ted Friend?

Professor Harris was not dismissed. He retired aged 67 after working at the University of Bristol for almost 40 years.

15. In this letter of complaint to Bristol university, Dr Ted Friend states "If a scientist does not agree with another persons conclusions, that is fine as long as they provide their justification for disagreeing. Pretending such a seminal work does not exist because it does not support their opinion , however is not science" Do you have any justification for not agreeing with the work of Dr Ted Friend, Dr Worthington or the Radford report which all included physical observational data on circuses?

Please see my discussions about inclusion criteria and research quality in my answers to earlier questions. In addition, the Radford report (published 2007) is considered by many to be scientifically inadequate, and this is one of the reasons why the Welsh Government commissioned a new report (i.e. our report) to revisit the issue 8 years later.

16. The Committee's terms of reference defines 'exotic animals' as 'any animal that is not native and is not a stock or companion animal.'

(a) Do you believe the term 'exotic' is satisfactory? If not, what would be a better term, and is it used in any other jurisdiction?

(b) Do you agree that this is a satisfactory definition? If not, what would be a better definition?

The term 'exotic' is also used in New Zealand legislation (see the Code of Welfare: Circuses 2018, <https://www.agriculture.govt.nz/dmsdocument/1405-Circuses-Animal-Welfare-Codes-of-Welfare>), though it is not defined explicitly. This Code actually applies to all animals used in circuses under the umbrella term 'circus animal', which is defined as "Any domestic or non-domestic, including exotic, animal kept in a circus for the purpose of public exhibition or performance."

In England and Wales the term is 'wild animal', which is defined in the Wild Animals in Circuses Act 2019 (England and Wales) as "an animal of a kind which is not commonly domesticated in Great Britain.". There is further guidance on the species that might fall into the definition of 'wild animal', from a British perspective, on page 29 of Annex A of "Zoo Licensing Act 1981: Guide to the Act's provisions", available from www.defra.gov.uk/publications/2012/09/11/zoo-licensing-act-guide-pb13793/.

In the Dorning report we use the term 'non-domesticated' and I believe this or its counterpart 'wild animal' is more descriptive than 'exotic'. However, any such term would require additional clarification and context.

The phrasing of the definition of 'exotic' in the Committee's terms of reference leaves the term open to interpretation and should be made clearer. 'Native' does not imply domesticated, and I think it is important to mention domestication in your definition. The process of domestication takes many generations of selective breeding and results in animals that are better able to cope with living with humans and this makes it more possible for humans to provide the animal with a suitable environment in which they can thrive. Using 'not normally domesticated' would ensure that the legislation also applies to animals that are native but not normally domesticated in Australia. The term 'companion animal' is also open to interpretation, since sometimes wild animals are kept as pets.

For more detail on the definition of a domesticated animal, I would refer you to the Dorning report, pages 21, 51 and 52.

17. The Committee's terms of reference refers to 'circuses'.

(a) Do you believe the term ‘circuses’ is satisfactory?’

(i) If so, how should it be best defined in legislation?

(ii) If not, what would be a better term, and is it used in any other jurisdiction?

(b) Some witnesses argued that the term ‘circuses’ could include agricultural shows, mobile zoos, and the supply of animals for use in film and television. Do you agree?

The term ‘circus’ is interpreted in different ways and there is a general lack of clarity surrounding the definitions of a ‘circus’, ‘mobile zoo’, ‘performance’. We discuss this in the Dorning report on pages 23-24.

Circuses and mobile zoos are both travelling animal shows that exhibit wild animals, and therefore they share many of the same welfare issues. But they differ in the frequency of travel and performance, and whether they return to a permanent base after each trip. I believe mobile zoos should be defined separately from circuses, but still included in any legislation.

I would not consider agricultural shows to be circuses, since the animals exhibited here do not exist primarily for the entertainment of humans. They are also domesticated animals.

I do not know enough about how animals used in film and television are kept, so I cannot comment on that.

Ultimately, any term is satisfactory as long as it is accompanied by a clear definition.

18. The Committee’s terms of reference refers to the ‘welfare’ of exotic animals and cetaceans.

(a) Do you believe the term ‘welfare’ is satisfactory?

(i) If so, how should it be best defined in legislation?

(ii) If not, what would be a better term, and is it used in any other jurisdiction?

I believe ‘welfare’ is an acceptable and widely recognised term. It is used in legislation by many EU and Non-EU countries (Dorning report legislation section, from page 12).

There is no single unified definition of ‘welfare’, but I will make a few key points here that I hope are helpful.

Scientifically, welfare can be defined as the balance between positive and negative experiences across different domains: nutritional, environmental, health, behavioural and mental. Welfare emerges from the combined and cumulative influence on these domains of all aspects of an animal’s management and environment, and good welfare exists when the management and environment meet an animal’s needs in most of these domains, most of the time. The welfare of an animal depends on its quality of life over its lifetime, including the manner of its death. This helps us determine the animal’s overall quality of life: is it ‘a life not worth living’, ‘a life worth living’, or ‘a good life’?

It is important to remember that welfare incorporates both the biological functioning of the animal, in terms of health, growth and reproduction, and the emotional state, such as feelings of reward, excitement and contentment, or frustration, boredom and grief. So very broadly, animal welfare can be assessed by asking two fundamental questions: “Are the animals healthy?” and “Do the animals have what they want?”.

For more detail I refer you to the Dorning report: we discuss the concepts, definitions and measurement of animal welfare from page 73 onwards and the first section is titled ‘Animal welfare - concepts and definitions’.