

Authors' reply to the review by Reviewer 2

Thank you for your effort spent on reading and reviewing our manuscript. We have replied to your comments below, in Calibri, bold text.

To clarify, the manuscript was originally written as part of a special issue focusing on animal welfare and ethics, but has now been moved to become a regular submission. Because of this we have, overall, toned down our focus on welfare. Instead the main focus of the paper is to discuss behaviour and cognition, with the impacts of these topics on welfare being more of a side topic. When discussing welfare, we mean welfare for all kept fowl, not necessarily poultry industry specifically (although, this is of course very relevant). Consequently, some of the Reviewer's comments are no longer relevant. We hope this is clear in our point to point reply below and when reading our revised version.

Line numbers refers to the numbers of the revised manuscript, i.e. the manuscript with track changes still intact.

Best wishes,

Hanne Lovlie, Laura Garnham

Review Report Form

OpenReview

- ☒ I would not like to sign my review report
☐ I would like to sign my review report

English language and style

- ☐ Extensive editing of English language and style required
☐ Moderate English changes required
☐ English language and style are fine/minor spell check required
☒ I don't feel qualified to judge about the English language and style

	Yes	Can be improved	Must be improved	Not applicable
Does the introduction provide sufficient background and include all relevant references?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is the research design appropriate?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are the methods adequately described?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are the results clearly presented?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are the conclusions supported by the results?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Because the manuscript is not an experimental study, we feel that several of the 'must be improved' ticked boxed above are hard to improve, and are not very relevant for our submitted work. If the Editor is not satisfied with our revision in terms of the above comments, please advise us on how to improve this to satisfaction.

Comments and Suggestions for Authors

This paper represents a nice idea, since the issue of the social regulation of domesticated Jungle fowls is highly captivating. More importantly, the resulting reflections in terms of minimising psychophysical suffering under cage constraints is definitely an important one.

Thank you for seeing value in our work and being positive in terms of the need for an overview as we here present as we too share this view.

However the paper has a minimal bibliography and most of the concepts are only touched upon. Overall, the paper should enlarge the text of 25-30 % of its present length.

As suggested by both Reviewer 2 and Reviewer 3, we have expanded the already quite extensive literature cited further in the current version of the manuscript (now 144 references). However, because there have been several recent thorough and excellent reviews and even books on the topic, we have not reviewed these topics in detail again. We have aimed to make this clearer in the revised version of the manuscript.

Specific points

Lines 23-24 even earlier: such a genetic ancestry, yet putative, deserves an entire paragraph.

We followed the suggestion of the reviewer and have extended the paragraph on the ancestry of the domestic chicken (now lines 27-32) to include more information on its genetic ancestry.

46-52: the massive literature on fowls social hierarchies, pecking order etc deserves at least a couple of paragraphs.

We have followed the suggestion of the reviewer extended the section on social dominance and social behaviour (lines 160-199). We feel further extension is not needed due to the recent extensive reviews on the topic by e.g. Pizzari 2016, Nicol 2015.

63-66 :sexual behaviour and especially cognition need further elucidation (about 3 para)

We have followed the recommendation by the Reviewer and have added more information on sexual behaviour (lines 191-255) in the revised version of the manuscript. We have also extended the cognition section by including information on several aspects of cognition as was requested by Reviewer 3 (lines 339-599). We hope these extensions are to the Reviewer's satisfaction. We would like to remind of the several, recent reviews

on these topics and that we have clarified in the current version of the manuscript that we do not intend to review these reviews in detail, but aim to expand on these.

91-96: bird olfaction, Floriano Papi's pioneering studies on homing pigeon navigation needed to be cited, with other authors, F. Bonadonna, seabirds, Annina Gagliardo, etc.

The Reviewer is correct in that there is a growing number of studies demonstrating that avian olfaction is not as poor as traditionally assumed. While the manuscript specifically focuses on fowl, we have chosen to not expand on avian olfaction here, but instead have included a reference to review on avian olfaction that discusses olfaction in a number of species, including pigeons and sea birds (line 117).

110-120: the impact on welfare is only mentioned; indeed, it represents a core issue of the present paper.

As mentioned in the beginning of our reply to the comments of Reviewer 2, welfare is no longer the core issue of this manuscript. We have however slightly increase the focus on welfare in the section on social behaviour, which is the section the Reviewer here refers to, accommodate the request by Reviewer 2.

119-120: in particular, male intraspecific aggressions are of paramount importance in terms of managing social settings. An entire para should be devoted to them and how to cope with escalation leading to injuries.

Thank you for your suggestion. Intra-sexual selection is of seminal importance for both male and female fowl, and aggression is an important part of this. However, as sex ratios are typically heavily female biased in industrial settings, we have decided to focus our discussion of welfare and social behaviour more on the issues of sexual harassment of females by males (e.g. lines 268-280), and reducing/limiting aggression in general (lines 324-336). The latter could include male intraspecific interactions but is not focused on this specifically. We have however overall added further literature on male aggression, with the aim to accommodate the comments by Reviewer 2.

146-156: how selection for domestication more precisely molded sensory "gates" in this strains? Clarify.

Our apologies, but we are not able to find what the Reviewer is referring to here, in the previous version of the manuscript. We hope however that with the revisions made, that this point has become clearer.

169-175: affective state. This is an original perspective, in need of further details and operative reflections for managing.

Thank you. We have now created a full section focusing on affective state itself (which was also suggested by Reviewer 3) and have increased the focus on welfare within this section (lines 339-377).

184- : fowl personality. Operational indications for keepers should be made by adding more space to them; as in the case of suine subjects (see papers by Francoise Wemensfelder, Edinburgh) animal personalities may in fact conflict with human personalities.

Thank you for the suggested literature, this is indeed an interesting idea, however Wemensfelder's work does not focus on fowl. We aim in the submitted work to specifically focus on the fowl. Therefore, we have chosen not to include this as we feel that including work on the personality of other animals and humans is going outside the aim of the current work. We hope this is clear in the revised version.

378-389: conclusions. They are definitely very, very poor statements.

We agree with the reviewer that the previous conclusions were not well aligned with the intended aim of the manuscript. We hope that with the clarified aims, the conclusions of our work are better matching (lines 669-695).

Submission Date: 01 October 2017, Date of this review: 27 Nov 2017 14:55:15