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## REVIEWERS COMMENTS AND RESPONSES OF THE AUTHORS

(Responses of author written in red – line numbers refer to the revised version)

### COMMENTS TO THE AUTHORS

Editor/Chief Editor Landbauforschung

Editor/Chief Editor Landbauforschung

We will accept your manuscript, subject to major revision. Please take into account the reviewers' recommendations and write a short response to each of the comments. The revised version of your manuscript will be evaluated again by the Chief editor and, if necessary, by the reviewers.

#### Some hints:

Line 186-189: In my opinion maybe here or as separate point also the appropriate control and responsibility of veterinary authorities or e.g. of mandatory visits of qualified auditors on the farms could be included, if you feel that is adequate. Also conflicts between business relation and supervisory duties of veterinarians on farms could be discussed here. **This recommendation is taken up and an appropriate text is included in lines 141 to 150.**

Line 133-144: There are lots of interesting articles on involvement of veterinary authorities and engagement of veterinarians to improve slaughterhouse control and carcass diagnosis to check for animal welfare problems and use it for early warning, e.g. Magalhães-Sant'Ana et al. Irish Veterinary Journal (2017) 70:24 DOI 10.1186/s13620-017-0102-0 9 or see <https://people.ucd.ie/alison.hanlon/publications>. Maybe include some of those efforts and results in your considerations. **I quoted two out of the recommended articles (one in the chapter about the animal health benchmarking, one in "Conclusions") and they are added to the "References".**

I also can inform you about a change we have undertaken here in the meantime: It is possible to give up to 20 references now with a position paper. This is in response to frequent comments of reviewers of our new format 'position papers' we faced in the last weeks. We hadn't expected this and I would encourage you to include more references as Reviewer # 2 suggests .

#### **Reviewer # 1:**

##### Accept with Major Revisions

This paper contains an interesting concept that should be published, on the importance of gradual improvements (continuous intervention) instead of complete solutions. Additional references need to be added to support your conclusions. **Several references are added.**

##### Comments by line

Line 18 - The five freedoms are only one framework for animal welfare. You need to recognize other frameworks such as Animal Welfare, Quality, David Fraser, and David Mellor.

Mellor, D.H. (2017) Operational details of the Five Domains Model and Key Applications to the Assessment and Management of Animal Welfare, Animals, doi:10.3390/ani7080060.

Welfare Quality and the Mellor Five domains are similar except that Mellor adds a 5th domain of mental states. The welfare quality website can be reached by typing Welfare Quality into Google.

Fraser, D. (2008) Understanding Animal Welfare Acta. Vet. Scandalizes. 50 (Supl 1). He has three domains: 1) Health, 2) Natural Living, and 3) Affective States.

**In lines 11 to 18, other major animal welfare concepts have been added.**

Line 130 - Add additional references for section 3.2 on benchmarking and assessment of animal welfare.

Richmond, S.E. et al. (2017) Evaluation of animal-based indicators to be used in a welfare assessment protocol for sheep, *Frontiers in Veterinary Medicine*, 4(210).

Grandin, T. (2017) On-farm conditions that compromise animal welfare that can be monitored at the slaughter plant, *Meat Science*, 132:52-58.

The article by Grandin has been added, the article by Richmond I did not include in the paper, since this article refers to animal oriented welfare indicators in sheep herds, but not to those indicators that can be recorded at slaughter, which are meant in my article.

### Reference on Electronic Assessment

Benjamin, M. and Yiks, S. (2019) precision livestock farming in swine welfare: A review for swine practitioners, *Animals* 9(4):133. Has been Included in the paper

The basic premise of this paper will apply to all four animal welfare frameworks: 1) The Five Freedoms, 2) Welfare Quality, 3) Dave Fraser, and 4) Five Domains. Adding additional discussion and terence's will greatly improve this paper.

### Reviewer # 2:

#### General comments

1. This position paper outlined the growing societal concern for animal welfare and current potential limitations in the early detection of animal welfare problems. It describes farm animal welfare as being a wicked problem. Three examples are provided to highlight strategies that could be implemented: (1) A database to capture relevant information on animal health and welfare which could be used by farmers and concerned citizens for benchmarking purposes. (2) A need to establish an appropriate stockperson to animal ratios, especially in the context of increasing herd and flock size 3. The use of technology to the betterment of farm animal welfare.

2. Identifying animal welfare as a wicked problem is interesting and there is a growing body of research that has adopted a stakeholder engagement approach. At times the arguments may be unsound or unfounded. For example criticizing the veterinary authorities for not having an early warning system. My understanding is that the competent authority in all EU member states is required to routinely record data on farm animals such as registration data including animal births and mortality.

Reviewer #2 refers to EU regulations on registering food animal herds and flocks and on routinely recording data on farm animals that are important for the control and prevention of emerging animal diseases, but these data are not standardized and not capable of being used for herd/flock health and welfare monitorings at national level. Lines 141 to 150 explain why nationally centralized databases using standardized health and welfare indicators need to be implemented to identify herds and flocks with health and welfare deficits.

The suggested national benchmarking system is something that has the broad support of the leading epidemiological working groups throughout Europe.

There is a wealth of published studies on animal welfare science, and animal ethics that is relevant to but not cited in this article. Such articles were added.

#### Detailed comments by line

3. Below are detailed comments and suggested changes to improve the quality of the article.

Line	
32	'Only the mildest possible treatment is allowed' Treatment is synonymous with veterinary care; instead replace with 'only minor infringements should be allowed' The text was changed according to this recommendation

33	'Causing any pain' Under nature conditions animals may suffer stress including pain, disease and injury; it would be better to qualify this statement by saying 'any <b>avoidable</b> pain' <b>The text was changed according to this recommendation</b>
36	Delete 'a mild treatment' <b>The text was changed according to this recommendation</b>
36	'Changes' should be 'change' <b>The text was changed according to this recommendation</b>
37-41	This is a generalization; the needs of animals differ with species. Procedures such as beak trimming and tail docking are conducted in chickens and pigs respectively. <b>The text was changed according to this recommendation</b>
38	Replace 'live' with 'express' <b>The text was changed according to this recommendation</b>
44	Replace 'missing...world' with 'suboptimal housing and management' <b>The text was changed according to this recommendation</b>
49	'Berkely' should be 'Berkeley' <b>The text was changed according to this recommendation</b>
Fig 1 & 2	'Framers' should be 'Farmers' <b>The text was changed according to this recommendation</b>
76	Replace 'not any' with 'no' <b>The text was changed according to this recommendation</b>
84-97	Delete 'The presupposition that' from each bullet point <b>The text was changed according to this recommendation</b>
105	Delete 'a blockage and' <b>The text was changed according to this recommendation</b>
106	Replace ' 'for even....doable changes' with 'to consider or implement practical changes' <b>The text was changed according to this recommendation</b>
107	Replace 'respectless' with 'disrespected' <b>The text was changed according to this recommendation</b>
107	Replace 'not at all...less' with 'are therefore not' <b>The text was changed according to this recommendation</b>
123	Replace 'animal welfare improving concepts' with 'examples of initiatives to improve animal welfare' <b>The text was changed according to this recommendation</b>
126	Replace 'concepts' with 'examples' <b>The text was changed according to this recommendation</b>
129	Replace 'data bank' with 'database' <b>The text was changed according to this recommendation</b>
130	Replace 'make...into' with 'are broadcast by' <b>The text was changed according to this recommendation</b>
133	Replace 'cachectic' with 'neglected' <b>The text was changed according to this recommendation</b>
133-144	<p>It is a big leap to blame the veterinary authorities. Perhaps the human health services may also be implicated, as there is research to demonstrate that farm animal neglect may be underpinned by the farmer failing to cope, and having poor mental health.</p> <p>Within the European Union my understanding is that the competent authority of each member state is required to have a database for farm animal registration, movement, mortality e.g. dairy and beef farmers require a herd number. This is important for traceability, biosecurity, animal health and welfare. You should check with the competent authority to find out what data are routinely recorded.</p> <p>Dead (and sick animals) will not be taken to an abattoir. It is more likely that they will be collected by an authorised 'animal by products collection service'.</p> <p>Taking the above into account, this section should be revised. Consider referring to regulations governing farming and slaughter including the responsibilities of the competent authorities and the routine data that they collect.</p> <p><b>See the explanations above and the new lines 141 to 150</b></p>

143	'The latter would...' Depending on the above, and assuming that there is already a database, it may be more appropriate to talk about data utilization as well as the type of data captured. See the explanations above and the new lines 141 to 150
149	This section refers to benchmarking – this is already used by some 'private standards' such as quality assurance programmes. Has been taken into consideration by quoting More, S.J. et al. in the section lines 141 to 150
149-151	From 'The data banks ...shortcomings'. It may be more appropriate to talk about the competent authority adapting current routine data capture to enable benchmarking, which would be of benefit to the farmer and support transparency for concerned citizens. This section would benefit from re-writing. See the explanations above and the new lines 141 to 150
173	Rephrase e.g. The drive to increase farm efficiency and productivity of animals conflicts with animal welfare. Done
175	Delete 'then starting and continuously' Done
177	Closing parenthesis missing '...houses)' Done
180	Delete 'against' 'obvious' Done
184, 186	Replace 'knowledgeable' with 'competent' Done
191	Replace 'Unfortunately ...feeling that' and replace with: Automation...is perceived as being detrimental for the animals'... Done
193	Replace ' This makes...technology' with 'However automation...' Done
197-200	delete 'in its beginning' insert 'recognize early signs of disease'. For example sensors can identify mild lameness or coughing...' Done
199	Replace ';additionally...observation' with 'Additionally they can record behavioural abnormalities such as fighting' Done
202	If something in the barn is... Done

## FINAL ACCEPT

Editor/Chief-Editor Landbauforschung

Landbauforschung: Accept (minor rev.)

We are pleased to inform you that **we've accepted your revised manuscript "Position Paper: Animal Welfare: Thoughts about how to achieve the most (for the animals!)"**, which you submitted to Landbauforschung – Journal of Sustainable and Organic Agricultural Systems.

There are only few questions and suggestions by the two reviewers left, please find them below. Please clarify and correct these points.

### Reviewer # 1

The paper titled *Animal Welfare: Thoughts About How to Achieve the Most for Animals* is now acceptable for publication. There is one small typo that needs correction on p. 1, line 40. The word *live* should be changed to *life*.

### Reviewer # 2

The revised position paper is greatly improved and almost acceptable for publication. There are some minor spelling errors, but also one issue regarding the lack of centralised database (line 149-151). This may be the case in Germany, and perhaps should be qualified by specifying Germany.

Please see the list of minor edits below:

Line 14 god – replace with 'good'

Line 40 live – replace with 'life'

Line 122 delete 'animal-welfare improving'

Line 144 -146 Delete 'as long only'

Line 149-151 Clarification is required regarding centralised data collection – this may be the case in Germany, but is not the case in Ireland, for example. The competent authority in Ireland (Department of Agriculture, Food and the Marine; DAFM) uses its Animal Identification and Movement (AIMS) database to identify at risk farms; see

· Kelly, P. C., More, S. J., Blake, M., & Hanlon, A. J. (2011). Identification of key performance indicators for on-farm animal welfare incidents: Possible tools for early warning and prevention. *Irish Veterinary Journal*, 64(1). doi:10.1186/2046-0481-64-13

· Kelly, P. C., More, S. J., Blake, M., Higgins, I., Clegg, T., & Hanlon, A. (2013). Validation of key indicators in cattle farms at high risk of animal welfare problems: A qualitative case-control study. *Veterinary Record*, 172(12), 314. doi:10.1136/vr.101177

Line 153 life - replace with 'live'

Line 165-166 'If they know their shortcoming...being consulted.' Do you mean that the evidence created by a nationwide database can be used by the farmer for herd or flock health planning?

Line 175 herd of - replace with 'herd or'

Line 208 replace 'very early limping' with 'subclinical lameness'