

REVIEWERS COMMENTS AND RESPONSES OF THE AUTHORS

(Author's responses are directly incorporated into the revised manuscript)

Editor/Chief-Editor Landbauforschung

The paper fits to the scope of the current issue and would match even better by setting a clear message on the role of ruminants and grassland systems in some sentences already at the beginning of the text.

Line 20, Line 182: Please add the full reference Uwizeye et al, 20XX.

Reviewer # 1:

Short summary of the aim of the paper, its main findings and conclusions

This essay is a brief position paper summarizing the latest research on the climate impacts of livestock production worldwide. After summarizing the research, the authors give four recommendations for lessening the significant impacts of livestock production.

General comments

The essay's brevity is a strength. This issue has been much in the news over the last decade (really since the 2006 FAO report). Having a clear and concise summary of the latest research is useful. Another strength is the focus on all of the steps that can and should be taken to mitigate the significant impacts of livestock production. The four suggestions are balanced and well supported by the evidence. A multipronged approach such as this is needed. One of the weaknesses of the essay is that it does not address the work of Frank Mitloehner (UC Davis). His research needs to be addressed explicitly as critics of this analysis are sure to bring it up.

Detailed comments by line

I do not have any line-level concerns. I would simply repeat that the essay really must address Mitloehner (and perhaps also Pitesky and Stackhouse). I know this is likely to be difficult in a brief position paper, but it really must be done.

A check if all conclusions are justified and supported by the results

Yes.

A check of the need for tables and figures, and the adequacy of the references

n/a

An evaluation regarding the originality, scientific quality and significance and quality of presentation

I would not say that there is anything original here. The collection and presentation of the science is clear, but not original. That isn't the point here. The presentation and defense of the four responses to the problem are not novel, but they are well presented and defended.

A comment on the English language and readability of the text

It is quite readable.

Recommendation

Minor revisions needed.

Reviewer # 2:

Short summary of the aim of the paper, its main findings and conclusions

The paper is a position paper, which deals with the links between livestock production and climate change. It presents some of the environmental problems associated with these systems and some options to reduce their GHG emissions and environmental impact for the future. Four main options are presented : increasing efficiency at all steps, proposing « new » grazing systems that would favour carbon sequestration and plant growth, completing nutrient cycles, and finding alternatives to conventional ways of production such as new sources of proteins, both natural or synthetic.

General comments

The subject is very important and needs to be considered, but I have some main concerns:

- It does not seem to me that the options presented are really new. This does not mean that they are already well considered in the field or within politics, but rather that it is not the first time that they are exposed. Furthermore, they are not exhaustive, so why did the authors choose these ones? Why is the term “agroecology” not stated?
- The presentation is quite negative on the impacts of livestock systems on the environment and climate change. Only some positive impacts are cited l.57-63. It would be necessary, at least rapidly, to replace the negative impacts within other major impacts of human activities. It would be useful also to provide numeric data for benefits (l.57-63) as it is done for negative impacts.
- Concerning alternatives such as synthetic proteins or vegetal substitutes for livestock products, their consideration would need a discussion about their potential environmental impacts (life cycle assessment), notably in terms of climate change, and of their cost (economy).

Specific comments

- It may be obvious, but please state clearly from the start of the paper, which kind of animal production is concerned: ruminants, all animal productions?

Recommendation:

My recommendation is that revisions are needed, and major revisions would be more appropriate.

REVISED VERSION

Editor/Chief-Editor Landbauforschung

Um wichtigen Forderungen der Reviewer doch noch zu erfüllen, schlagen wir daher vor noch drei kleine Einschübe in Ihren Text zutätigen:

1. in Zeile 16, zitieren von: "Mitloehner (2010)", siehe Anmerkung von Reviewer #1

Mitloehner FM (2010) Is the rising demand for animal protein fuelling climate change? Journal of Animal Breeding and Genetics, 127: 421-422. doi:[10.1111/j.1439-0388.2010.00909.x](https://doi.org/10.1111/j.1439-0388.2010.00909.x)

<https://onlinelibrary.wiley.com/doi/full/10.1111/j.1439-0388.2010.00909.x>

Mitloehner stimmt in diesem Paper trotz seiner anderen Einschätzungen zur Gültigkeit von den Aussagen von "Livestocks Long Shadow" in entwickelten Ländern zu, dass das Wachstum der Tierhaltung in walddreichen Gegenden Asiens und Südamerikas erhebliche Auswirkungen auf des Klima haben kann. Das passt zu Ihrer Passage "...through habitat occupation and change".

2. In Zeile 60/61: Einfügen der Worte und einer Quelle : "...and must be integrated in sustainable agricultural concepts (Bonaudo et al. 2013)" (Siehe Anmerkung zu Agroecology von Reviewer #2)

Bonaudo T, Bendahan AB, Sabatier R, Ryschawy J, Bellon S, Leger F, Magda D, Tichit M (2014) Agroecological principles for the redesign of integrated crop–livestock systems. Eur J Agron 57:43-51, doi:<https://doi.org/10.1016/j.eja.2013.09.010>

3. In Zeile 83, Einfügen der Worte: "and agroecological development" (Siehe Anmerkung zu Agroecology von Reviewer #2)