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## International Agricultural Trade, Geopolitics and Global Food Security

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### Exploring the determinants of livestock transportation across country borders

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**Livestock trade, literature review, policy, socio-cultural factors, technical factors**

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## **Exploring the determinants of livestock transportation across country borders**

### **Summary**

Throughout the world, living animals are transported across country borders. Whilst transported for many purposes e.g., slaughtering and fattening abroad, a global view of the drivers of these transports remains missing. We performed a systematic analysis of the available body of scientific literature to get an overview of the existing literature on this topic and the knowledge gaps concerning the transport of living animals across national borders. We found a total of 24 containing statements and examples about factors driving and shaping the international trade of live animals. We found that drivers could be categorized into political, economic, technical, socio-cultural and environmental drivers. In addition, we found that the described main challenges related to livestock transport concern animal welfare and diseases. Our study shows a vast potential for further exploration, specifically regarding the analysis of the grey literature.

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## 1 Research questions

The transport of living animals over long distances and across national borders is at the basis of many livestock production chains worldwide (Miranda-de la Lama et al., 2014). These living animals are transported out of their original country most often for further steps in the production cycle. Nevertheless, multiple issues with international transports of living animals are increasingly emergent. One of the issues is related to the public opinion. As animal transport is visible for society, it is subject to the public opinion (Buddle et al., 2018). Another issue along with these specific examples, regards animal welfare and is raised in relation to the condition of international transport of living animals by truck and boat (Fleming et al, 2020). A different issue is the environmental impact of transport of living animals. Recently, research showed that greenhouse gas emissions resulting from transport in the food value chain appeared 3.5 to 7.5 times higher than previously estimated (Li et al., 2022). While research focuses mostly on describing the flows between countries within the trade networks of living animals (e.g., Barberis et al., 2020), still a full overview of the determinants of the transports of live animals across country borders is missing. In this paper, we aim to perform an extensive literature review to answer to the following research question: *which are the main drivers and shapers of the international transport of living animals and how are they categorized?*

## 2 Data and methods

We conducted a systematic literature review following the PRISMA guidelines (Page et al. 2021). First, a search question is executed in a chosen data base. Subsequently, the results are screened on predetermined eligibility criteria based on increasing text amounts: in a first step, the article is screened based on the title and abstract; in a second step, the article is screened based on the full article text. Web of Science and Scopus were used as databases with the search question: TITLE-ABS-KEY ( ( "boat" OR "truck" OR "transport" OR "trade" ) AND ( "international" OR "border\*" ) AND ( "pig\*" OR "pork" OR "cattle" OR "beef" OR "chick\*" OR "living animal\*" OR "livestock" ) ). Articles were included if peer-reviewed and published in English. Transport of living animals across borders should be the main interest of the article. Furthermore, the articles were included if they describe an original qualitative, quantitative or mixed-method study. On top of that, literature studies were included if describing or giving insight into the transport of living animals across borders. All statements giving insight into the drivers and shapers of international transport of living animals were noted and classified.

## 3 Main results

The search string identified 6,635 articles in total, with 5,719 unique entries. A number of 5,435 articles were excluded based on the abstract and title. Based on the full-text assessment, 240 of the 284 remaining articles were excluded, resulting in a total of 44 included studies in the systematic literature review. Of these articles, 24 statements were noted and five main categories emerged. The category 'political' (number of articles containing relevant statements N=12), consists of all drivers and shapers of international livestock transport that

are related to policies and laws, either on global or regional scale. A specific example consists of the legislative requirements for identification of farm animals in the EU (e.g. 92/102/EEC) (Ammendrup & Füssel, 2001). The category ‘economical’ (N=7) consists of monetary drivers and shapers of international trade of living animals. As examples, in case of slaughtering the monetary value of the meat is the main driver of the transport (Seng and Laport, 2005), whilst for fattening purposes the economies of scale and cost efficiency are main driving factors (Haxsen, 2010; Hop et al., 2014). The category ‘socio-cultural’ (N=7) consists of socio-cultural factors regarding transport of animals driving or shaping the international transport of living animals. Research conducted by Sinclair et al., (2019) showed that perceptions on the livestock transport industry is mainly depending on the culture and country. The category ‘technical’ (N=6) consists of infrastructural and technical factors driving or shaping the international transport of living animals. Infrastructure is a prerequisite for transport, wherefore infrastructure can be a barrier as well as an enabler for cross-border transport of living animals (Valerio et al., 2020). The category ‘environmental’ consists of ecological and natural factors driving and shaping transport of living animals. As an example, the transport of living animals over the border between Somali and Kenya, increases as a result of droughts (Ng’asike et al., 2020). In addition to the drivers and shapers of living animal transports, insights from the literature review showed that the main challenges related to livestock trade regard animal welfare and diseases. Our study shows a vast potential for further exploration, specifically regarding the analysis of the grey literature.

#### 4 References

Ammendrup, S., & Füssel, A. (2001). *Legislative requirements for the identification and traceability of farm animals within the European Union European Community legislation on identification of livestock, except Equidae*. 20(1760), 437–444.

Barberis, E., Freddi, D., & Giammetti, R. (2020). *Economia agro-alimentare / Food Economy Trade Relationships in the European Pork Value Chain : A Network Analysis*. 22, 1–23.  
<https://doi.org/10.3280/ecag1-2020oa10070>

Buddle, E. A., Bray, H. J., & Ankeny, R. A. (2018). “I Feel Sorry for Them”: Australian Meat Consumers’ Perceptions about Sheep and Beef Cattle Transportation. *Animals*, 8(10), 1–13.  
<https://doi.org/10.3390/ani8100171>

Fleming, P. A., Wickham, S. L., Barnes, A. L., Miller, D. W., & Collins, T. (2020). Varying opinions about animal welfare in the Australian live export industry: A survey. *Animals*, 10(10), 1–19.  
<https://doi.org/10.3390/ani10101864>

Haxsen, G. (2009). Interregional and international competition in German piglet production. *Landbauforschung - VTI Agriculture and Forestry Research*, 2(60), 79–89.

Hop, G. E., Mourits, M. C. M., Lansink, A. G. J. M. O., & Saatkamp, H. W. (2014). *Cross-border collaboration in the Field of Highly Contagious Livestock Diseases : A General Framework for Policy Support*. 61, 300–315. <https://doi.org/10.1111/tbed.12020>

Li, M., Jia, N., Lenzen, M., Malik, A., Wei, L., Jin, Y., & Raubenheimer, D. (2022). Global food-miles account for nearly 20% of total food-systems emissions. *Nature Food*, 3(6), 445–453. <https://doi.org/10.1038/s43016-022-00531-w>

Miranda-de la Lama, G. C., Villarroel, M., & María, G. A. (2014). Livestock transport from the perspective of the pre-slaughter logistic chain: A review. *Meat Science*, 98(1), 9–20. <https://doi.org/10.1016/j.meatsci.2014.04.005>

Ng'asike, P. O., Stepputat, F., & Njoka, J. T. (2020). Livestock trade and devolution in the Somali-Kenya transboundary corridor. *Pastoralism*, 10(1). <https://doi.org/10.1186/s13570-020-00185-y>

Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D., et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71

Seng, P. M., & Laporte, R. (2005). *Animal welfare : the role and perspectives of the meat and livestock sector The expectations of the products*. 24(2), 613–623.

Sinclair, M., & Phillips, C. J. C. (2019). *Welfare Issues*.

Valerio, V. C., Walther, O. J., Eilittä, M., Cissé, B., Muneeppeerakul, R., & Kiker, G. A. (2020). Network analysis of regional livestock trade in West Africa. *PLOS ONE*, 15(5), e0232681. <https://doi.org/10.1371/journal.pone.0232681>