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Network analysis of Danish pig movement data from 2006 to 2015

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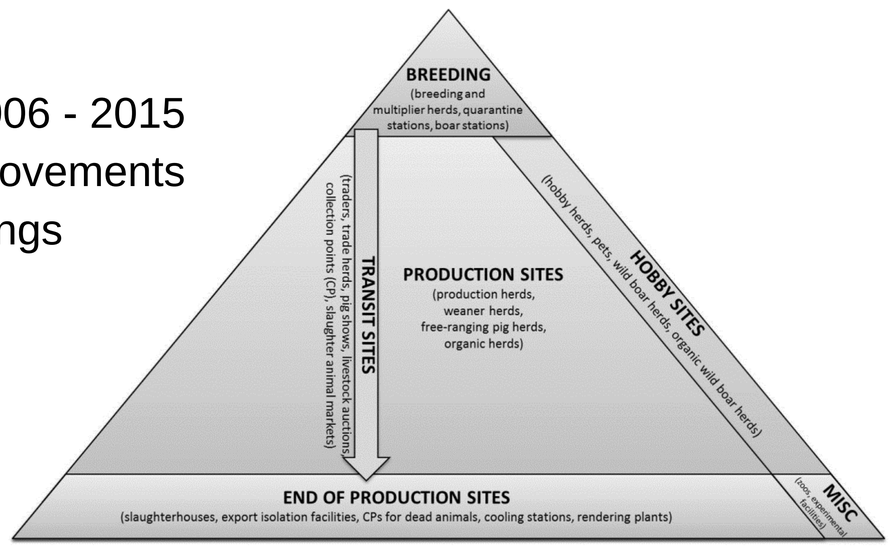
Background

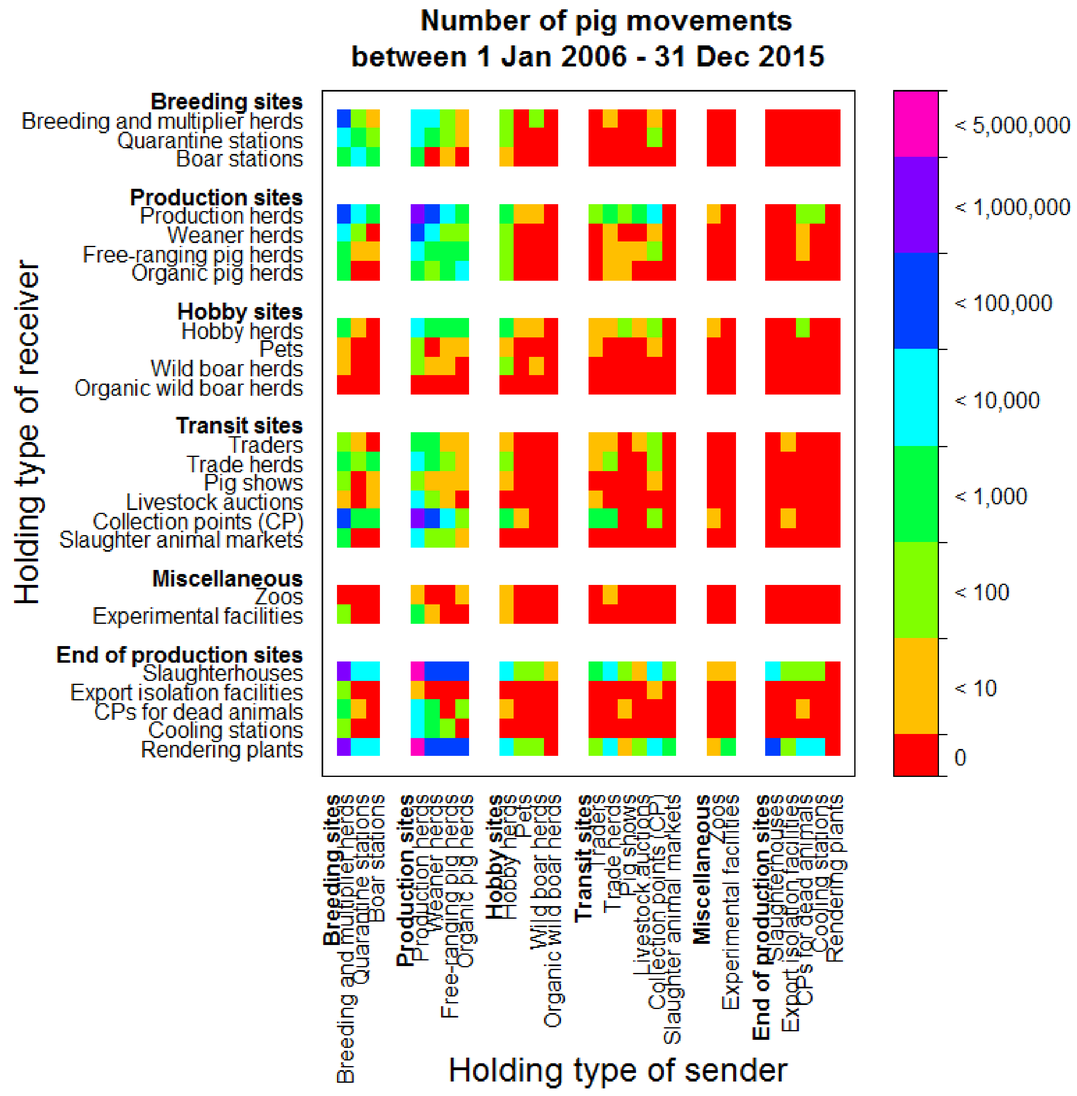
Transmission of livestock associated Methicillin-resistant *Staphylococcus aureus* (LA-MRSA) via animal movements is believed to be one of the main drivers for LA-MRSA spread between pig holdings. Analyzing the Danish pig movement network enables us to understand movement patterns and thus helps in the efforts to control LA-MRSA spread.

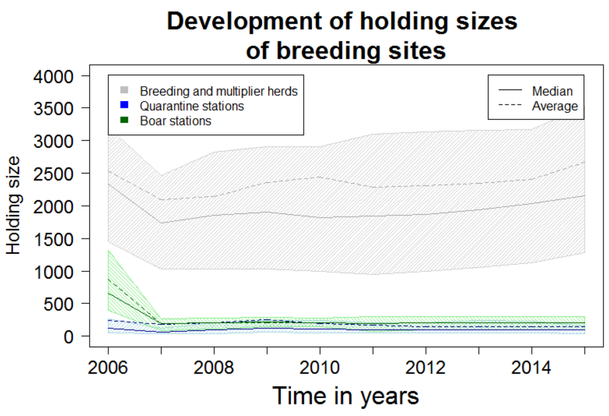
Objective: Comprehensive description and exploration of changes over time of the Danish pig movement network

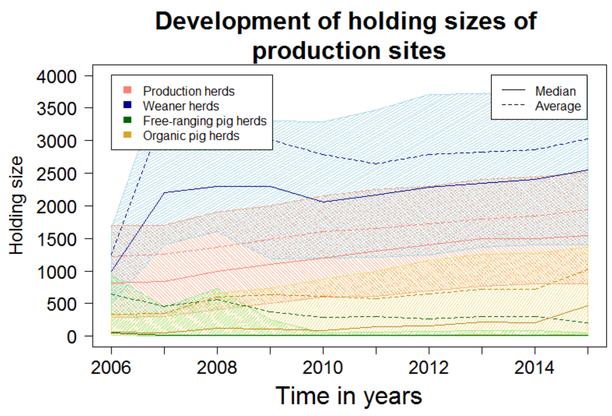
Material

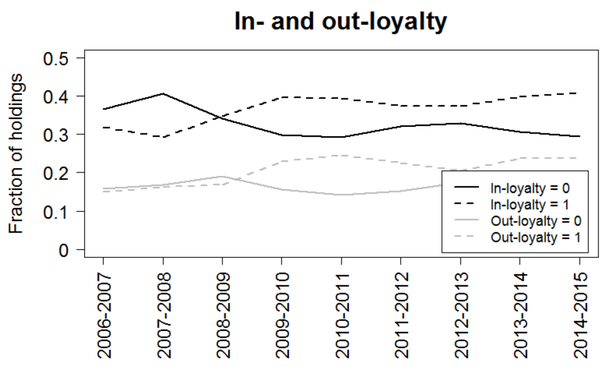
- Study period: 2006 - 2015
- 7,617,681 pig movements
- 16,069 pig holdings

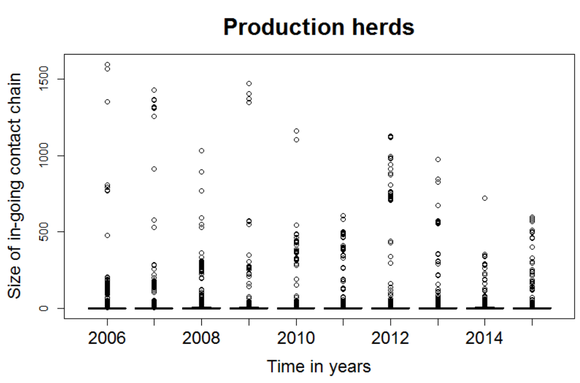


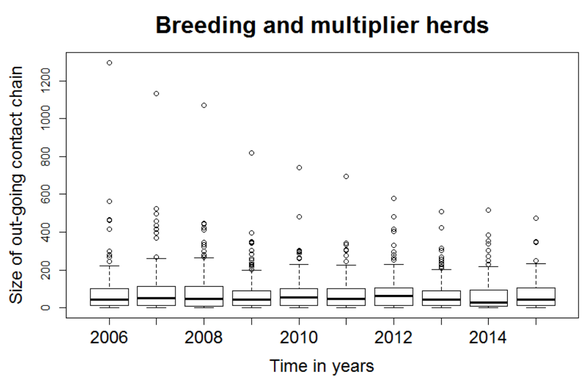












Conclusions

- The **holding sizes** of production sites increased over time, whereas the size of breeding sites remained constant.
- The fraction of holdings with high **in-loyalty** is higher than the fraction of holdings with high **out-loyalty**.
- All production sites showed low levels of **in-going contact chains** and we observed high values for **out-going contact chain** for breeding and multiplier herds.
- Our results reflect the **pyramidal structure** of the Danish pig production.
- **When designing surveillance and control programs to limit the spread of LA-MRSA via pig movements, horizontal connections and production cycles should be taken into account.**

Acknowledgements

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