

74TH EAAP ANNUAL MEETING

Boot swabs to assess efficiency of cleaning and disinfection of slatted floors in pig barns

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Introduction

- In pig husbandries: cleaning and disinfection (C & D) are important tools to control transmission of pathogens between batches.
- Assessment of success of C & D via bacteriological examination.
- Sampling methods with a high level of sensitivity and repeatability required.

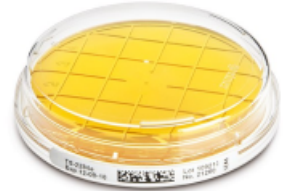


Source: umwelbundesamt.de



Evaluating the effectiveness of C & D

- Swab methods could be an appropriate alternative to other established methods (e.g. agar contact plates).
- Aim of the study: Conducting a boot swab sample method to assess the success of C & D in pig barns.



Source: sigmaaldrich.com



Source: pigprogress.net

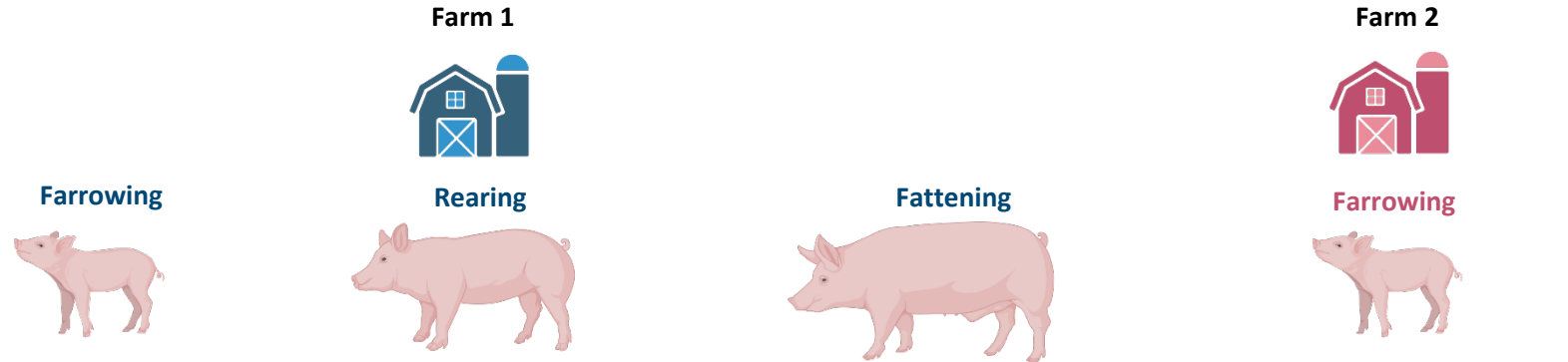


Material and Methods

- Two farms in Northern Germany: pig barns (farrowing, rearing and fattening) with slatted floors.
- C & D between batches: specialized contractor according to standard protocols.
- Inside the barn, a pair of moistened boot swabs were pulled on and barns were sampled by walking diagonally through the compartment.
- Sampling before water cleaning (BC), after water cleaning (AC), after disinfection (AD).



Material and Methods



BC	11.09.2018	04.07.2018	11.09.2018	26.08.2019	04.07.2018	11.09.2018	24.05.2019	15.08.2019
AC	14.09.2018	06.07.2018	14.09.2018	01.07.2019	06.07.2018	17.09.2018	24.05.2019	15.08.2019
AD	17.09.2018	09.07.2018	17.09.2018	04.07.2019	09.07.2018	19.09.2018	25.05.2019	16.08.2019

> 24 h



Material and Methods

- Microbiologic examinations of swabs: total aerobic bacterial counts (TAC), count of enterococci (EC) and *Enterobacteriaceae* (EB)
- Bacterial counts were converted to \log_{10} -values for statistical analyses.
- Bacterial counts were first compared between production types at every point of sampling.
- Furthermore, a general linear mixed model was used to compare the bacterial loads at every point of sampling for each bacterial parameter.



Source: pigprogress.net



R.H. Mateus-Vargas

\log_{10} cfu 250 ml⁻¹



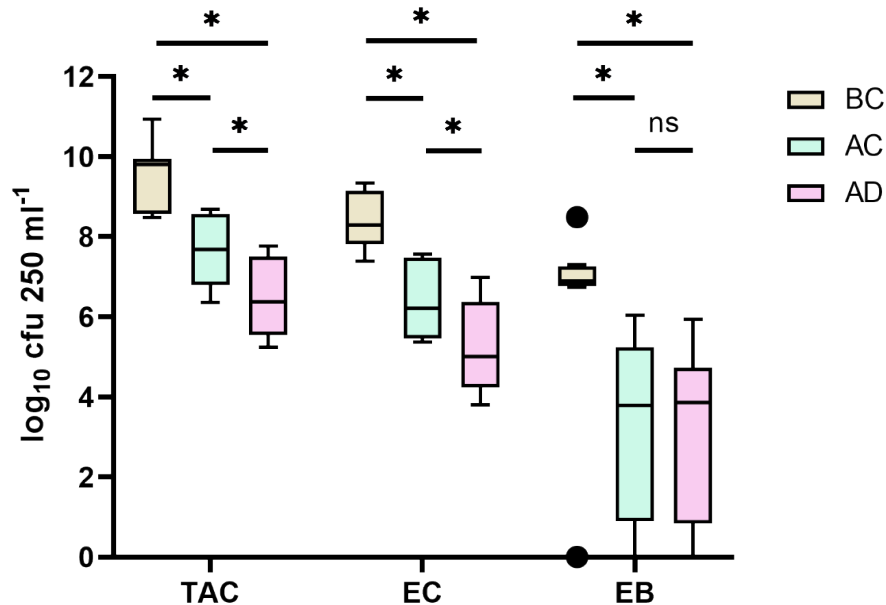
Results

- Generally, TAC and counts of *Enterobacteriaceae* differed moderately between production types.
- Differences between farms and production types were not statistically significant.
- Therefore, bacterial counts were analyzed together for every point of sampling (BC, AC, AD).





Results



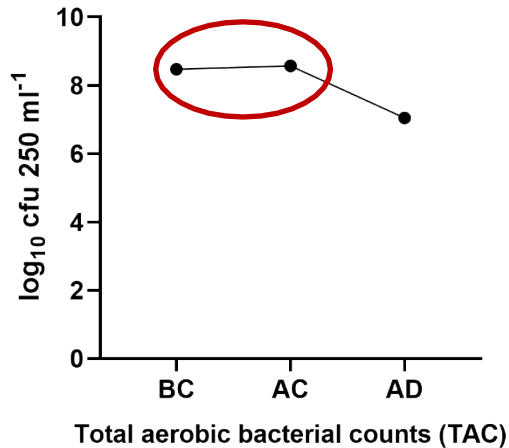
The means of culturable bacteria of swab samples (log₁₀ cfu 250 mL⁻¹) for the total aerobic bacterial counts (TAC), enterococci (EC), and *Enterobacteriaceae* (EB).

- ⇒ Following cleaning (AC), a **general reduction** (around 2 log₁₀ cfu 250 mL⁻¹) was reported for all but one C & D round in a farrowing barn.
- ⇒ After disinfection (AD), **further reductions** were generally observed for **TAC and EC**, with one exception in a rearing barn.
- ⇒ Bacterial loads of *Enterobacteriaceae* (EB) were **not significantly reduced by disinfection (AD)**.

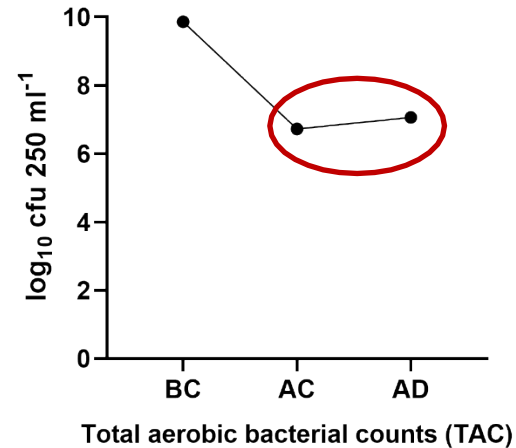


Results

⇒ Examples of the exceptions detected using boot swabs.



Total aerobic bacterial counts (TAC) in one **farrowing barn** during a C & D round.



Total aerobic bacterial counts (TAC) in one **rearing barn** during a C & D round.



Discussion and Conclusion

- Boot swab sampling permitted to assess the effectiveness of C & D procedures at different time points in barns of different pig production types.
- Differences on outcomes at AC and AD seemed to be related to variations on C & D procedures during specific C & D rounds, and not to the production types or farms.
- Therefore, detection of unexpected outcomes was possible, which may indicate incorrect performance of C & D protocols.

➔ Important for animal owners or specialist contractors!!



Discussion and Conclusion

- Other explanations may be related to use of boot swab sampling on structured floors:



Boot Swabs or
e.g. Agar
Contact Plates



**Bacterial counts in the slots
remain mostly unknown!**

- In the future, explore the possibility of complementing boot swab sampling for structured floors with other methods to record contamination in the slots.



Thank you for your attention!

Do you have any questions or comments?

For further reading:



agriculture



Article
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